The University of Chicago
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STANDARDIZATION OF THE SCHOOLS OF KANSAS

A DISSERTATION

SUBMITTED TO THE FACULTY OF THE GRADUATE SCHOOL OF ARTS AND LITERATURE IN CANDIDACY FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

(DEPARTMENT OF EDUCATION)

BY
JOHN ADDISON CLEMENT

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CHAPTER I

GENERAL INTRODUCTION

The attempt is being made in many states, and in particular throughout the states of the Middle West with their state-controlled systems of education extending from the elementary school to the university and college, to relate and unify more closely than has hitherto been the case the primary schools with the secondary, and the secondary with the higher institutions of learning. Some of the forces or factors in this movement have not originated directly in the schools and not all have been equally appreciated or consciously operative toward the unification of state school systems.

Obviously one of the first steps to be taken toward the effective direction of these factors is a determination of the actual existing conditions as regards the correlation or lack of relation between the different units in the state's educational system. One of the readiest means of estimating the existing relations is through a study of the records made by the students who pass through the three institutions from primary to higher education. If the pupils as a group of individuals maintain about the same relative standing in their work as they pass from one institution to another this is good evidence that the work in the institutions concerned is closely related, and it will be one object of this thesis to try to establish this contention.

Several years ago in looking over the high-school certificates kept on file at the University of Kansas the writer became interested in making certain comparisons of the standing of pupils between the high school and university and it occurred to him that it would be interesting and worth while to go farther than this, and on the basis of the estimates given by teachers in the form of school marks attempt an evaluation of the relative standing of pupils on a sufficiently comprehensive scale to afford a reliable measure of the existing relations of educational institutions throughout the whole state.[1]

[1] The problem taken up in this thesis was first suggested several years ago by the appearance of Professor Dearborn's bulletin on "The Relative Standing of Pupils in the High School and in the University," *Bulletin No. 312*, High-School Series, No. 6, University of Wisconsin. The writer's investigation during this year has been carried on at the University of Chicago under the inspiration and supervision of Professor Dearborn.

The problem, then, before us is a state-wide canvass of the existing conditions in respect to the question just raised. Obviously not all the pupils in the schools of a state could be studied, from merely physical limitations of the investigation, but it is believed that a sufficiently wide and discriminating sampling of the school population of the whole state has been made, such that the results to be presented are reliable and representative of the actual conditions. Since we are to study the schools through the individuals who pass through them, the more specific question at issue at the outset is to point out the relation between the scholarship of an individual in his earlier school career and the scholarship of his later career. Do pupils who have a good standing based upon their first educational endeavors maintain the same relative standing when they pass on from the elementary institutions of learning to the secondary schools, and also when they pass on into the higher institutions of learning? And do pupils who begin their school life by doing mediocre and poor work respectively maintain their relative positions throughout their school careers?[1]

Granting that this is a question of sufficient concern to justify a careful investigation, it is assumed that one legitimate means of determining the relative standing of pupils from year to year, either within the same institution or the relative standing between different institutions, is through the records which have been preserved.

Any insistence upon the importance of keeping records seems almost unnecessary, and yet a few very commonplace analogies may serve to re-emphasize the importance of continuous records over a series of years in any kind of institution whatsoever.

Business organizations regularly take account of stock. They make an exact estimate of their profits and losses for the year. On the basis of past records and on the basis of present needs and demands they plan for the advance year's work. Intelligent methods of procedure, and intelligible ways of preserving the facts, and clear means of recording the progress of the business are always of vital concern. Manufacturing plants of all kinds are directed and controlled by persons who know precisely the amount of the output, together with its quality. The efficiency of such plants as this can be determined best through the preservation of the ways and workings of the institutions. And in

[1] Since the records only of the pupils who graduated both from the grammar school and high school have been used there was very little opportunity in this study to consider the problem of elimination, and of course in the part of this thesis which deals with the three-institution comparison the very nature of the problem excluded the question of elimination before the first year of college work.

order to get a proper estimate, the records need to be preserved throughout a series of years.

The painstaking care of all scientific biologists in the cultivation of the many forms of plant and animal life is suggestive for the modern educationist's procedure.

Great progress, too, is being made in scientific agriculture throughout our whole country. The soil is scrupulously analyzed in order to discover what sort of seed will do best when put into a certain quality of ground. Great care is taken to breed up the finest quality of grains, plants, and animals. Records are kept covering a series of years in order to get a scientifically balanced judgment in the midst of varying conditions caused by the great variety of factors entering into the growth of any one single product. Similarly there is sufficient complexity in all the affairs of the mental life of individuals to baffle the untutored mind in trying to make analyses of the progress of pupils from year to year.

Ignoring for our present purpose many analogous points of interest to be found in these business concerns, manufacturing establishments, plant cultivations, and agricultural pursuits relative to our school system, the analytic care and concern which extends over a period of years is one principle of large significance to be carried over. The intelligent preservation of intelligible records is a second vital principle, the neglect of which may easily be discovered by any thoroughgoing examination of our present systems of record-keeping in the schools. And yet it has been suggested to the writer a number of times by school people during this investigation that teachers and officers of one institution of learning should not be expected to be held accountable for the progress in the institution to which the pupil passes on. One plausible answer to such a query is: If teachers and school officers are not responsible for keeping continuous records of boys and girls over a period of years, who is responsible for such data?

Everyone grants at once that school systems are institutions which are invaluable assets to any country, state, city, or community. In the United States one hundred years ago the problem of education was simpler and in some ways even primitive. But with the increasing complexity of our social, economic, and industrial and agricultural life there is a new demand made upon everyone who pretends to help guide the educational affairs of our country.

When the outside occupations in the home life supplemented so largely the school in the midst of that simple rural community life

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As to the form in which records have been either temporarily or permanently preserved there is a wide variation in practice, and as to the form in which they should be preserved there is much difference of opinion. In some of the grammar schools records were preserved only in the private books of the individual class teachers; in others these marks had been transferred to large loose sheets on file in the principal's office. The most satisfactory ones had been preserved in large bound volumes accessible to all the teachers and school officers, of which type several schools had records extending back for ten or twelve years.

In the high schools the temporary records on the whole had been placed upon cards filed in boxes alphabetically arranged and the permanent records had been preserved in large bound volumes. Some colleges prefer very much the loose or removable leaf to the large bound volume which, too, would no doubt be a satisfactory plan for the high schools.

In this discussion an emphasis on the preservation of records that cover a period of years has a large significance, for without this it is scarcely possible to get an estimate of pupils as they pass from one institution to another, and consequently impossible to get a measure of efficiency between various institutions.

Now in one large city studied—not in Kansas—it is customary to send up to the high school certificates containing the grades received by the pupil in the different subjects studied during the last year of the grammar school. In the high schools of Kansas it is the practice to send certificates containing the high-school marks to the colleges to which high-school graduates go. It would be a comparatively simple matter to place upon this certificate sent by the high schools to the colleges at least the standing of the pupil in the eighth-grade work, and consequently this would furnish a line on the standing of the individual in the three institutions of learning from primary to higher education. Such data as this kept on file in the vaults of the colleges would not only be the means of furnishing a line on the school career relative to the scholarship of a pupil, but with a sufficient number of these files a more adequate measure of the institutions throughout the state could be obtained.

Two features found in the practice of two different high schools tended toward a preservation of complete and intelligible records. In one high school the eighth-grade standing had been recorded in the same bound volume on the same page with the complete high-school standing. In another high school it was possible to tell from the record

just when a pupil did take a certain subject. If a fourth-year pupil took a first-year subject for some reason or another, it was clearly indicated; that is, the record showed precisely the order in which the pupil actually took his work.

The records used in this thesis were in part secured from the certificates on file at the colleges, and in part from the files in the offices of school principals and school superintendents. Approximately 5,000 records of high-school graduates were collected. But comparatively few of these could be traced back into the elementary school and also up into the college.[1]

The attempt has been made, as stated, to secure records from as nearly representative schools as possible, attention being given to size, location, organization, and to records covering a series of years sufficient to be significant.

The cities represented within the state of Kansas vary approximately from 100,000 to 5,000 in population. Several cities of 50,000 population are represented, and several of 15,000. Some towns smaller than those of 5,000 population, too, have been used in the comparisons. Two large cities and two smaller towns in other states than Kansas have been included in part.

The larger cities here concerned in Kansas are distributed geographically over the north, east, south, and middle west of the state. There are probably not sufficient varying factors in these schools on the social side to affect them very materially. At least in such an agricultural state as this class distinctions as yet play a comparatively minor part in school life.

The general method of procedure used in this study has been used chiefly by Professor Dearborn, Professor Thorndike, and Mr. Ayres. In addition to its value in securing accurate results, one of its chief virtues, it is believed, is its *problem-raising* power, which has always been regarded a valuable part of any vitalizing philosophy or science. And this method will perform a large service if it succeeds in raising many significant questions, whether it succeeds in furnishing an answer to all the practical difficulties involved in the problems or not.

Since it is frequently true in the field of pedagogy that mere opinion and off-hand momentary estimates or snap-shot judgments have been

[1] The writer is deeply indebted to the many principals and superintendents and trained helpers who so kindly assisted in collecting the material used in this thesis. It is impossible to be personal in my thanks to all the persons who assisted. While the whole study will be made as impersonal as possible, a private record of all results will be preserved, so that in case any principal or superintendent desires to inquire as to the particular results of his school he may do so.

substituted for the statement of facts well tested through a scientific method of inquiry, this newer method of approach in education ought to have much value. It is the purpose of this treatise to try out many cases before drawing conclusions. In all cases the conclusions are regarded as subject to revision, and they will need to be tried out by other persons. But even such temporary resting-places are much better for educational procedure than are the random and dogmatic judgments too often found in our pedagogical literature. This does not mean to condemn whatever has been good and valuable in our present practice.

Investigators who try to use marks as one basis of evaluating some phase of a school system cannot assume the rôle primarily either of critics or prophets. It is their business to indicate as accurately as possible the results of the existing practices of our school system. The by-products which come with such an investigation, however, should not be regarded as unimportant.

One hears frequent questions of doubt as to whether a scientific evaluation in education is possible. It is commonplace for school people even to ask, "How can mind, being so complex, be estimated upon the basis of marks?" And, "Does not the personal equation of the teacher practically vitiate all comparable results?" "Is not the individuality of the pupil suppressed by trying to subject it to any uniform or translatable system of grading?"

These questions do suggest obvious difficulties. But is mere complexity of mind to baffle us? An objection of this sort, while apparently baffling, will not stand the test of any thoroughgoing analysis. To admit that the mind activity of the pupil is too complex to be evaluated in any sense is partially to admit that we are not worthy of the trust of educating children. Marks in some sense should indicate a real analysis on the part of the teacher of the child's mental ability. It is not the purpose of a scientific study of education to ignore the importance of all the humanizing influences of teachers through their different personalities. But it is our duty at times as educationists also to make even a somewhat cold-blooded analysis of our system on its own account.

Any far-reaching system of marking which we may later on evolve will take account of all types of individuality. Both the weak and the strong will be estimated according to their real abilities and will be rated in such a way that results will be comparable throughout any one system or between one system and another.

In the midst of our much-debated questions of the relation of primary to secondary education and especially of the relation of the high school

to college, we need to cause these institutions to look intelligently back and forth at each other. Reciprocal action and adjustment is one need, if not the great need, of primary, secondary, and higher education. If we are going to unify these different stages in any adequate sense, one means for bringing it about is through such an investigation, based upon well-tested results, as will show the actual facts resulting from present practices.

In order to get any basis for standardization of schools in any state it will be necessary to find out as accurately as possible what are the actual relations existing between various institutions with reference to present practice. After having determined such relations through the relative standing of pupils on the basis of scholarship or marks recorded, it will be somewhat more easy to say what amount of retention we ought to expect to obtain between the different schools.

The following discussion will therefore attempt to set forth legitimate means and methods for ascertaining reliable facts relative to present practice, and then on the basis of such results venture a statement as to what we may have a right to expect with reference to the amount of retention within a standardized state school system.

CHAPTER II

STATEMENT OF THE PROBLEM AND METHODS

As has been indicated in the introduction, the specific problem is concerned with the *relative standing* of pupils in the several institutions; namely, grammar school, high school, and college. The present discussion will deal with a comparison between the standing of pupils in the grammar school and high school; a comparison between the standing of pupils in high school and the same students in college; and lastly a comparison of the standing of the individuals who have attended all three of these school institutions from the lower to the higher.[1]

The general attitude in the second part of the discussion referred to above (the high school-college comparison) is well illustrated in the *University of Wisconsin Bulletin* written by Professor Dearborn:

> The admission to college of students from the accredited schools is determined almost entirely by school records or standing of the applicants, although there is an occasional admission made which is not based wholly on the previous record of the pupil. One purpose of this study is to inquire into the efficiency of this method of admission to college by determining to what extent and how accurately the high-school records forecast what pupils are likely to do in the way of scholarship in the college or university. The main problem is somewhat more general than this and of wider interest; namely, to what extent students maintain in the university the relative rank which they held in the high school. That is, are the best and poorest students in the university those who stood respectively highest and lowest in their high-school classes? Is the "average" student in the university class identical with the "average" high-school pupil of a few years previous? Or is it true that these relations are to a considerable extent reversed and that many of those who do poorly are quite as likely to lead their classes in the university as those whom the high school considered its better students?[2]

It has been stated above that college students in Kansas are admitted through a certificate granted by the various high schools to the graduates, although a considerable number of students do enter the colleges

[1] These comparisons will be supplemented, in the first two sections of chap. iii, by a comparison of pupils within the grammar school, and also within the high school itself.

[2] *Bulletin of the University of Wisconsin, No. 312*, High-School Series, No. 6, pp. 7, 8.

on conditional terms after having done as much as three years of high-school work. The standings or marks which are found on these certificates, or else the standings as recorded in the offices of the high schools, serve as a basis of the high-school and college comparisons.

There is not absolute uniformity in these certificates, though in general they are alike. Some schools make a practice of sending only the grade made during the second semester of the year in any subject. Other schools average the standings of the two semesters' work in any subject for the year and place this estimate upon the certificate sent to the college. Occasionally certificates simply indicate that the student has passed in his high-school subjects but no grades are reported. Some of the schools which use the letters or figures do not interpret these in terms of per cent.

Since it is very difficult to get, at present, a large number of pupils who have attended all three of these institutions, the other separate comparisons within the respective institutions of the grammar school and high school, and those between the grammar school and high school, and further those between the high school and college have all been used as a sort of check of investigations. Probably the most original part of this study is the comparison made between the pupils who attend all three institutions, since no one so far has done this particular piece of work.

There are many other problems than this one of the relative standing of pupils which could be worked out from this same body of material collected for the present purpose, and for those who care to do it, other comparisons could be made from the charts just as they stand. There is opportunity for comparing various systems of grading. The relative standing of the same individuals in various subjects could be determined. From this same body of data a comparison of small high schools and the relative standing of the pupils of the large high schools could be carried on. One could test the standing of pupils in required and elective subjects. One could compare the standing and scholarship of boys and girls. One could tell accurately out of 5,000 pupils how many of them had pursued Latin, modern languages, or any other subject. But whatever by-products may come out in this discussion, they are all secondary to the main problem dealing with the relative standing of pupils in different institutions.

The old-line subjects have been used exclusively. It will readily be observed that the subject of English has been most frequently used in the comparisons. It serves better than any other subject to give a

long line on the pupil's work and school career. The required amount of English in most of these high schools is three years; a few, however, do four years' work. In the main, the comparisons between different institutions are carried on between the same subjects. English, however, in the grammar school is used in a few instances as a basis for comparison with Latin and modern languages, as well as with English in the high school. Manual training was not general enough in the schools concerned as far back as it was necessary to go for some of the records in order to be considered.

The method one uses in this sort of investigation is more or less determined by the nature of the data at hand. The practice of keeping school records involves many variable factors. Some schools record only yearly estimates, others record both semester estimates, still others record an average of the two semester estimates. Where the two semesters' marks were available the average of this was always used. The great majority of the first-year college records used represent an average of two semesters of work. There was great difficulty in determining in many high schools and in some colleges in what year certain subjects had been pursued. The averages which have been used are usually averages in different years of the same subject rather than averages of various subjects.

One of the most disturbing aspects of this whole study has been the attempt to translate satisfactorily the various systems of marking into comparable forms. The bases of grading represented by the colleges are the letters *a*, *b*, *c*, and the figures 1, 2, 3, and the ordinary percentage system. Some of the figures, however, are stated in terms of percentages; for example, in one institution 1 represents 90–100; 2, 80–90, and 3, 70–80.

The marks used by high schools vary from the percentage system to the use of the letters *a*, *b*, *c*; *e*, *f*, *g*; *e*, *g*, *m*, *p*, with the occasional use of the plus and minus. The figures 1, 2, 3, 4 are frequently used, too, with the plus and minus. In the grammar schools the per-cent system is used together with the letters *a*, *b*, *c*; *e*, *f*, *g*, together with e^1, e^2, e^3, e^4, e^5, indicating 91, 92, 93, etc.; 1, 2, 3, 4 with frequent use of plus and minus; 1, $1\frac{1}{2}$, $1\frac{1}{4}$, $1\frac{1}{8}$, etc. A few schools insisted on not reducing the letters and figures to any percentage.

The range of grading in grammar schools varied from 60–100, 70–100, 75–100; in high schools, from 60–100, 70–100, 75–95, 75–100, 80–100; in the colleges, 70–100 and 75–100. The range of grading will show clearly in the charts of chap. iii.

In interviews with the different school principals, superintendents, teachers, and officers within the same school there was frequently a lack of definiteness of opinion upon the interpretation of marks in actual use. One can scarcely avoid reaching the conclusion that there has been a great deal of ragged, haphazard, and lumping-off work done in this matter of rating individuals. If a marking system is to be of any account at all, it must necessarily be more than a random momentary decision. On the other hand, there was no school which did not have some strong point in its marking system, or in the keeping of its records. But it is not infrequently the case that one ward principal or high-school principal is very little in touch with his neighboring school, however good this system may be.

There is a sufficiently large body of well-tested material here, if collected into a unified form, to furnish guidance and a working basis for an ideal school, both in practice and theory. One of the outcomes of these investigations ought to be the occasioning of free discussions as to the best methods of rating pupils, and of other questions vital to the progress of any school which pretends to be modernized.

The schools will be numbered instead of named, since the study is intended to be as impersonal as possible. It will not, however, be possible to number all the grammar schools separately. They have been charted in composite form in the various cities and all have been given one number as representing the grammar school.

The majority of the comparisons in the grammar school include only the eighth grade, and those in the college the first year. In one large city the seventh grade completes the grammar-school work. In this case the seventh grade in place of the eighth is used. A limited number of cases have been traced through the sixth, seventh, eighth grades, through the high school into the university, and a comparison made between the standing of these pupils in the three different institutions.

Wherever the standings of individuals have been indicated in terms of percentage the same graphic scheme is used as that found in the bulletin of the University of Wisconsin. "Each student whose marks or grades enter into this study has been assigned an individual number. . . . . The student's rank is indicated by placing his number above the proper grade in the horizontal scale of marks as arranged in the accompanying chart" (p. 15).

When the range of grading is, for example, from 75 to 100 per cent, or from 60 to 100, then an individual's number is placed above the

horizontal line over the grade which indicates his standing. After the distribution of marks is made in the charts, the individual numbers are divided into three equal groups or divisions called "tertiles."

Those numbers which occur in the high third in any chart which is used for a basis of comparison—for example, between the grammar-school English and high-school English—are starred in the high-school chart representing the high-school English. That is, if a certain number occurs in the first chart in the high tertile it will be starred in the second chart with which it is compared, no matter in which tertile it there appears. The numbers appearing in the original chart in the lowest third have a minus sign attached in the second chart, which indicates that originally this number had appeared in the lower tertile, no matter in what tertile it occurs in the second chart. The numbers within the original middle group appear in all cases in the second chart with which the first chart is compared without any signs attached.

By this scheme it is possible to trace out any individual pupil as he passes from one institution to another, for illustration of which see sec. I in chap. iii. It is also possible to find his exact place within any tertile at any time. Through this number scheme of charting it is a simple matter to determine the percentage of retention of any group as a whole between one institution and another.

The tertile division was used for several reasons. When the divisions are too many the perpendicular broken lines are likely to fall on the median or are likely to fall in columns where persons in a higher and lower tertile have really the same standing. The tertile grouping is more economical, and sufficiently accurate for a basis of measurement; and where a three or four or five estimate is used in grading the tertile grouping is large enough and even better than a fine division.

It is better to place those who have the highest average at the top of a particular column which indicates the same integral per cent, because in some cases when the groups are divided it is necessary to divide the column by a broken line. Wherever averages have been used, those having the highest fraction of any one integral percentage are usually placed at the top of the column.[1] But where only a final grade, for instance in the first year of the high school, is available, it is not possible

[1] That is, where it is necessary to use a broken line in dividing the tertiles it is fairer to put the pupils with the higher average in the higher group. In such a chart as No. 3, the column over 90 per cent was proportionately divided. This was done in instances when there was practically no difference between the standings of the pupils in the column considered.

to differentiate so closely in a column of figures which may appear over 86 per cent, for example.

In case letters or figures were used for marking the standings of pupils these have been reduced to a percentage basis and then charted. Where there are only several estimates made in a scale of grading and when the number of cases being considered is large, it makes the columns high. So that it was necessary to break up these columns in the charting and use an accompanying graph to represent the actual distribution of the marks in a given subject. The broken horizontal lines in this case indicate the number of persons receiving any one grade, and the graphs are reduced in size when the original is too large to be printed. A very few charts appear which represent absolute estimates rather than relative standings.

A composite of 23 high schools has been used where a small number of pupils from each high school were represented in the same college. It was ascertained from the principals what percentages used by these various high schools would be equal to the 1, 2, 3 used in the college. These percentages when translated into the 1, 2, 3, forms, were charted and compared with the standings of these same individuals in the college.

The tertile tables used contain a summary of the percentages of retention. The following is a type of those used later on in chap. iii.

	History School 5 8th Grade				
7th Grade		1	2	3	% Tertile Retention
	1	22	11	4	59.45
	2	11	16	12	39.49
	3	4	12	21	56.75
	Total Retention				51.78

A brief general description will here suffice, for these tables will be explained in fuller detail as they appear in the later discussion. The number 22 in the first table indicates that 22 persons who were in the first tertile of the group in the seventh grade in history remained in the first group or tertile in the history work of the eighth grade, or that there was a retention of 59.45 per cent of the high group. The number 11 indicates that 11 of the pupils who originally were contained in the first group fell to the second group in the eighth-grade history work, and the 4 indicates that 4 persons who originally stood in the first tertile in seventh-grade history fell to the third group in the eighth-grade history work. By reading diagonally across the table, the numbers 22,

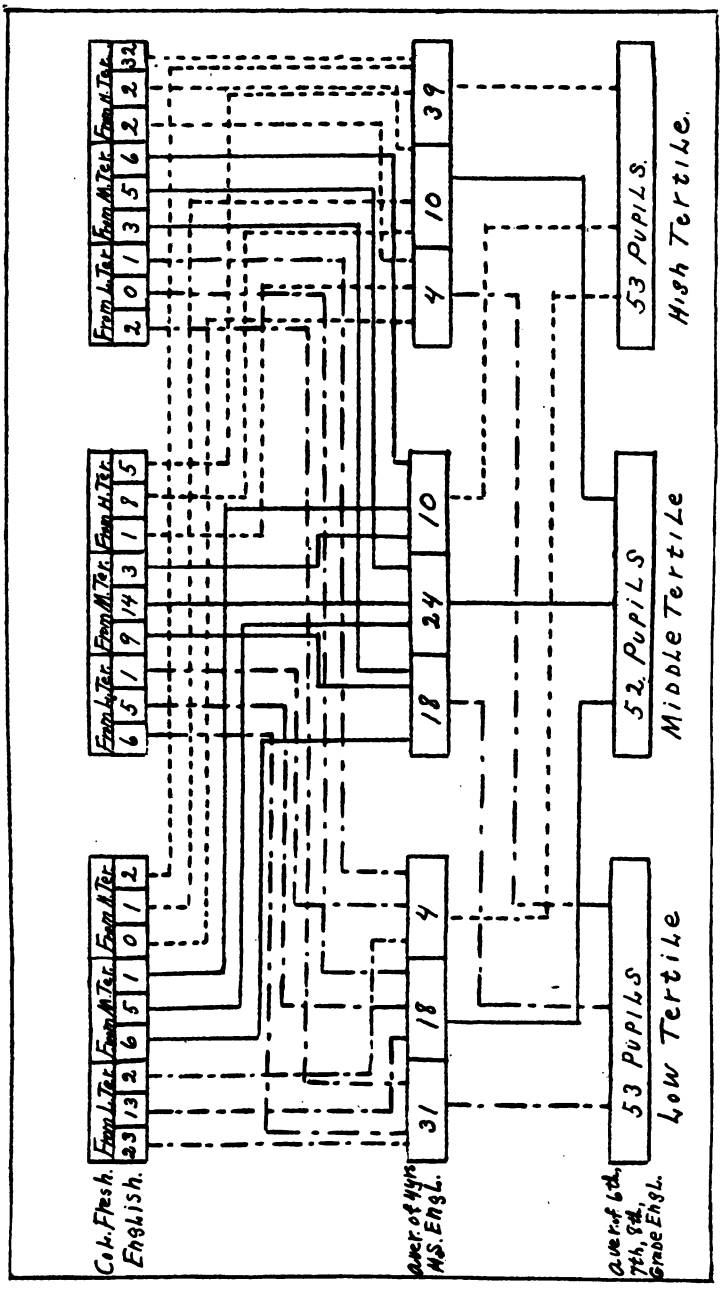


DIAGRAM I

Showing group retention of 158 pupils through grammar school, high school, and into college

15, and 21, the number of pupils retained in each tertile is ascertained. Or if 22, 15, and 21 are each divided by the equal number representing the three groups, the respective percentages of retention for each tertile are ascertained, namely, 59.45, 39.49, and 56.75. By such a table it is easy to summarize the retention of each tertile when any two charts are compared. This is designated as the "tertile method."

A supplementary device may be used for comparing the retention when three institutions or three years' work are involved. It is the use of a diagram which shows just how many pupils are retained within the original group in which they began, and also shows the nature of a pupil's *progress* after beginning work in any one year or in any one institution. Diagram I is an actual case, but the charts of this diagram are not included in this study.

The diagram has the advantage of showing which way the original group as a whole either progresses or declines. It indicates not only the final classification of the groups, but it indicates the quality of pupils who constitute the groups. The rectangles at the bottom of the diagram show that there were originally 53, 52, and 53 pupils in the high, middle, and low thirds in an averaged sixth-, seventh-, and eighth-grade English. The dotted lines leading from the first rectangle show that 39 of the 53 pupils who originally were classified in the high third rose to the high third when an average of the four years' high-school English was used; that 10 pupils fell to the middle third, and that 4 pupils fell to the third group in the high-school work; when the high-school English was compared with the first-year college English, 32 pupils out of the 39 who are retained between the grammar school and high school, are further retained in the high third of the college. By following the heavy dotted line leading from the high third it will be observed that 32 pupils out of the 53 originally in the first tertile held that place throughout the three institutions. By following the heavy continuous line representing the middle group, or third, it may be observed that out of the 52 pupils who originally began in the middle tertile 14 passed straight through in the three institutions. By following the broken line it may be seen that 23 pupils out of the original 53 in the upper tertile have passed through without deviating from the high group. It will be easy to trace the pupils from the second year, or the second institution, as the case may be, to the third year or institution, if it will be noted that the lines fall in groups of three at the top of the diagram. By a glance at any of the diagrams it may be noted that comparatively

few pupils pass from one extreme to another. This fact may be seen also from the tables that accompany diagrams II, III, IV, V.

The second general method used in the following comparisons is designated as the "modified median method." The retention is ascertained by finding the average of the percentages of those pupils in the

Name -- (Pupil No. 32)

('04)Elem Sch.No 5				('07)H.S.No.5					('11)College No.2				
	6th	7th	8th		Fr.	So	Ju.	Se		Fr	So	Ju.	Se.
Arith	95 100	88 67		Math	93	94			Math.	81 87	84 92		
Read.	95 95	90 89		Lat.					Lat				
Gram.	93 79	90 66		Eng.	86	86	85	87	Eng	84	93 85		
				Ger.			88	91 78	Ger	91 95	82 87		
				Phys.			89		Phys Sci.				
Hist.	93 88	90 77		Hist.		88			Hist.		89 84		
Physiol				Bot.	92				Biol Sci				

high and low groups of one year's work or in one institution who in the successive year's work or institution remain above or below the median. The final conclusion will be stated in terms of this method.

A very simply arranged card was printed for the purpose of preserving the records collected. The above card is an exact duplicate of pupil number 32.

CHAPTER III

COMPARISON OF THE RELATIVE STANDING OF PUPILS IN GRAMMAR SCHOOLS, HIGH SCHOOLS, AND COLLEGES

Chap. iii includes an extensive and detailed statement of the comparisons made on the basis of marks. Because of the length of this chapter and because of the many charts presented, it was thought advisable to give the separate conclusions at the close of each section. The more general conclusions growing out of these comparisons have been brought together in a summary way in chap. iv.

For convenience of treatment the comparisons in chap. iii, as has been indicated in chap. ii, have been divided into five sections. Necessarily there is some overlapping in the data used in these different sections. The first one is a comparison of the standing of pupils within the grammar school itself; the second, a comparison of the standing of pupils within the high school itself; the third, a comparison between the standing of pupils in the grammar school and high school; the fourth, a comparison between the standing of pupils in high school and college; and lastly, a comparison of the relative standing of a limited number of the same pupils who had attended all three institutions—namely, grammar school, high school, and college.

The reasons for making these separate comparisons are probably self-evident. The writer believed that it would be of some importance to know what is the actual *relative standing* of pupils within any one institution itself. On the basis of such knowledge as this it would be easier to conclude what ought to be expected to be the relation between different institutions.

In connection with each chart presented, certain significant facts will be pointed out, as, for example, *the range of the scale of grading, the different forms of the distribution of marks over the scale, the shifting of groups as a whole, the interrelation of subjects within the same institution, the relation between grammar school and high school based upon a comparison of different subjects, the relation also between the high school and college, noting in what cases the percentage of retention is the highest.* Not all of these points will necessarily be taken up in each chart and section, but those which have especial significance will be briefly discussed.

SEC. I. GRAMMAR-SCHOOL COMPARISONS ONLY

Briefly stated, the object of this first section is to determine what is the correlation within the grammar school itself on the basis of comparisons made between single subjects. This has been used as a sort of check experiment for the later comparisons between different institutions. The first part of sec. I is a comparison between the standings of pupils in the same subjects but in successive years.

The charts numbered from 1 to 10 in sec. I represent the distributions of marks received by pupils in the seventh and eighth grades in the subjects of English, history, and arithmetic in schools No. 5′ and No. 7′. Some references will be made also to charts used in following sections.[1]

The groups of pupils in the charts are all divided into tertiles as nearly equal as possible. This fact holds throughout this thesis with the exception of a very few charts which have been constructed upon the basis of absolute marks.

Chart 1 shows the distribution of marks given in the eighth-grade history of 112 pupils. There are 37 pupils in the high tertile or group, 38 in the middle tertile, and 37 in the lower tertile, or division. The numbers that are starred in this chart indicate that originally these same numbers represented individuals who stood in the high third of the seventh grade. Those numbers accompanied by minus signs indicate that originally these same individuals appeared in the lower third in the seventh-grade history work. Those figures which are not accompanied by any signs indicate individuals who were found in the middle group of the seventh-grade history work.

The percentage of retention in the upper tertile is easily ascertained by dividing the number of starred individuals in the second chart who remain in the upper third or tertile by that number of individuals who were in the original chart within the high group. For example, in chart 2 there are 37 pupils within the high group. In chart 1, as shown by the starred numbers, 22 of these same pupils remain in the high third of the eighth-grade history. When 22 is divided by 37 the retention is found to be 59.45 per cent for the high group. The retentions for the other tertiles may be obtained in a similar way.

[1] The records from No. 7′ were difficult to secure for both the seventh and eighth grades. In school No. 5′ records were available for a number of years back. The records for school No. 5′ used here extend from 1902 to 1907; 33 graduates are represented from 1907; 29 from 1906; 30 from 1905; 17 from 1904; 2 from 1903; and 1 from 1902.

Above each chart the percentages of retention appear in whole numbers. In such summary tables as I, II, for example, the retention is carried out to two decimal points. By reading diagonally across the table, the numbers 22, 15, 21, for example, it is always possible to see at a glance the number of pupils who are retained within the respective tertiles.

In case anyone desires to do so, he can readily follow out the career of a particular individual by means of the number which represents that pupil. In charts 1 and 2, number 34 retains not only his position within the high group of the eighth-grade history, but he retains the same absolute per cent. Number 60 retains the same absolute grade within the middle group of the eighth-grade history. Number 4 passes from high third to low third, and number 10 from low third to high third. Any individual may in this way be followed out in all, or in any, of the successive charts.

Some further details of the charts may be pointed out. Those from 1 to 10 show that there is some variation in the distribution of marks over the scale used, not only when the two schools, No. 5′ and No. 7′, are compared but when the distribution of marks within the same school in different subjects are compared.

In charts 5 and 9 or charts 3 and 8 it may be seen that the range of the scale varies, being in school No. 5′ from 75 to 100 per cent and in school No. 7′ from 60 to 100 per cent. The effects of probably a too extensive range of marks are illustrated in chart 5 as compared with the more successful grouping in charts 1–4 and 9, 10.[1]

It may be noted at a glance that although the same pupils are involved in both subjects they are as a group graded distinctly higher in history and in arithmetic than in English. And this holds true of both the seventh- and eighth-grade work. For illustration of this fact refer to charts 1–4, and 9, 10. This same tendency obtains in charts 38, 46, 48, used later on, which include in the 212 pupils there compared the same 112 pupils in these earlier charts. So that the same tendency obtains with an increased number of pupils from this same school. Whether such an arrangement of grouping as this noted above is just to the pupils is a question which will be raised again.

While there is a tendency toward a normal distribution of grades in such charts as No. 3 and No. 4, yet in such charts as No. 1 and No. 9 there is a considerable "skew" in the curve of distribution toward the

[1] While 60 per cent is the minimum grade in any one subject in school No. 7′, yet an average of 70 per cent in all of the subjects is required for promotion to the high school. In school No. 5′ it is not customary to average all the subjects together, and the required grade for promotion must be made in each subject respectively.

top of the scale. All of the charts 5, 6, 7, 8 show a decided skew toward the higher end of the scale of marks. Unused marks in the scale occur quite frequently. Although the actual range of grading is supposed to begin with 60 per cent as the lower limit, there are very few marks appearing below 75 per cent. It might conceivably be answered that if the number of pupils to be considered were much larger than this, then these gaps would be filled up, and this is true in a partial sense. But chart 55 in an advance section includes these same pupils in a group of 270, and although some of the gaps are here filled up, comparatively

7thnGrade	History School No. 5′ 8th Grade				
	1	2	3	Ter. Ret.	
1	22	11	4	59.45	
2	11	15	12	39.49	
3	4	12	21	56.75	
Tot. Ret.				51.78	

7th Grade	English School No. 5′ 8th Grade				
	1	2	3	Ter. Ret.	
1	23	8	6	62.76	
2	11	17	10	44.84	
3	13	21	56.78		
Tot.Ret.				54.46	

7th Grade	English School No. 7′ 8th Grade				
	1	2	3	Ter. Ret.	
1	14	8	4	53.84	
2	10	10	6	35.74	
3	2	8	16	61.53	
Tot.Ret.				51.28	

7th Grade	Arithmetic School No. 5′ 8th Grade				
	1	2	3	Ter. Ret.	
1	22	9	6	59.45	
2	10	13	15	34.21	
3	5	16	16	43.24	
Tot. Ret.				45.53	

7th Grade	Arithmetic School No. 7′ 8th Grade				
	1	2	3	Ter. Ret.	
1	15	8	3	57.69	
2	6	13	7	46.42	
3	5	5	16	61.53	
Tot.Ret.				56.41	

Table I.
Showing retention between seventh and eighth grade work.
(DUPLICATE of Tab. I)

very few are to be found below 75 per cent. One question which this provokes is: What effect does this have upon the percentage of retention? This point will be raised later on. Table I is a summary of the percentages of retention in dealing with a comparison of the relative standing of pupils between the seventh- and eighth-grade work, according to the tertile method of grouping.

There is some difference in the percentage of retention between the two schools No. 5′ and No. 7′ in arithmetic. The higher percentage of retention in school No. 7′ in arithmetic at first thought argues for a somewhat closer correlation between the seventh and eighth grades. But it may be the effect of the wide range of a too detailed scale of grades used. From table I it may be seen that the correlation is the higher between seventh- and eighth-grade English in school No. 5′, but that the correlation is the higher between seventh- and eighth-grade arithmetic in school No. 7′.

Another convenient method for ascertaining the relation between the seventh and eighth grades is to determine what percentage of the pupils in the high and low group in the seventh grade remain above or below the median, respectively, in the eighth grade, and then to find the average of these two percentages.[1]

For the subject of English in school No. 5′ the retention is 72.97 per cent for the upper group and 81.08 for the lower group, the average being 77.05. In arithmetic it is 72.97 per cent for the upper and 62.16 for the lower group, the average being 67.56. In history, for the upper third it is 81.08 per cent, and 78.37 for the lower third, the average being 79.76.

For the subject of English in school No. 7′, the retention by this same method of comparison is found to be 69.23 for the upper third and 84.23 for the lower third, the average being 76.73. In arithmetic it is 80.74 for the upper and 69.23 for the lower third, the average being 74.98 per cent.[2]

The percentage of retention is the highest in the subject of history in school No. 5′ in terms of method No. 2, namely, 79+ per cent. In school No. 7′, it is highest in the subject of English, the average of the high and low third being 76+ per cent.

These results indicate that there is a retention of at least 75 per cent in the majority of the subjects compared, in terms of the average of the percentages of those pupils in the upper and lower tertiles who remain above or below the median.

By the use of these same charts a brief comparison was made between the standings of the same pupils in different subjects in the same year.

Since the subject of English was used as the basis for the majority of comparisons, it seemed worth while to find out by a few comparisons whether pupils have a tendency to be equally good in all subjects or whether pupils who are good in English might show quite a different amount of capacity in other subjects. If the pupils who take English do equally well in the other subjects then the frequent use of English as a basis of comparison in this thesis will appear somewhat more justifiable.

Chart 4 representing seventh-grade English is compared with chart 2 representing seventh-grade history. Chart 3, or eighth-grade English, is compared with chart 1, or eighth-grade history. Eighth-grade

[1] For definition of median, see Professor Dearborn's *Bulletin on Relation of High School and College*, p. 17.

[2] For convenience the first method of comparison used will be referred to in this thesis as the method No 1, or the "tertile method"; the second method used will be referred to as method No. 2, or the "modified median method."

English is compared with eighth-grade arithmetic, and seventh-grade English with eighth-grade arithmetic. These are the same 112 pupils in all cases, but the correlations are not shown in separate charts from those used in the first comparisons.

The percentages of retention for this comparison are shown in table II. The retentions for charts 4 and 2, for example, are as follows: 54.05 per cent for those in the high third in the seventh-grade history. The percentage of retention for the lower third is 56.75, and the total is 51.78 per cent. That between the eighth-grade English and eighth-grade history is a total of 53.57, and that between eighth-grade English and eighth-grade arithmetic is a total of 52.67 per cent. While that between seventh-grade English and eighth-grade arithmetic is lower than the others, it is high enough to be significant.

7th Grade Eng.	Hist. Sch. No.5 7th Grade			
	1	2	3	Ter. Ret.
1	29	12	5	54.05
2	10	17	11	44.73
3	7	9	21	56.75
Tot. Ret.				51.78

8th Grade Eng.	Hist.Sch.No.5 8th Grade			
	1	2	3	Ter. Ret.
1	31	15	3	66.75
2	11	16	11	42.10
3	5	9	23	62.76
Tot.Ret.				53.57

8th Grade Eng.	Arith.Sch.No.5. 8th Grade			
	1	2	3	Ter. Ret.
1	32	11	4	69.45
2	11	16	11	42.10
3	4	2	31	86.78
Tot.Ret.				52.67

7th Grade Eng.	Arith.Sch.No.5. 8th Grade			
	1	2	3	Ter. Ret.
1	33	8	6	62.76
2	11	14	13	36.05
3	3	16	18	48.64
Tot.Ret.				49.10

TABLE II

Showing the retention of pupils between different subjects in the same year.

In table II the total retention between the seventh-grade English and the seventh-grade history is the same as is the total retention in table I between seventh-grade history and eighth-grade history—namely, 51.78 per cent. The total retention when different subjects are compared is above 50 per cent, and if the previous method of comparison other than that of the tertile grouping is used, the retention here again would be about 75 per cent. And so from this limited comparison of 112 of the same pupils in different subjects the result is that a large number of those who do well in one subject are likely to do well in another subject, and that those who do poorly in one subject will be likely in large numbers to do poorly in another subject.

It may be seen from table II that there is very little difference between the retention in the seventh-grade English and seventh-grade history, between the eighth-grade English and eighth-grade history, and between the eighth-grade English and eighth-grade arithmetic. The total retention for the eighth-grade English and eighth-grade history is a little higher than is the total retention for eighth-grade English of the same pupils and eighth-grade arithmetic.

From both of these comparisons, then, between the same subjects in different years, and between different subjects in the same year, within the grammar school, the results show a retention of about 75 per cent in terms of the averages of the percentage of those pupils in the high and low groups who hold their places above or below the median.

Chart No. 5.
8th Grade Arith. of same 78 pupils, School No. 7.

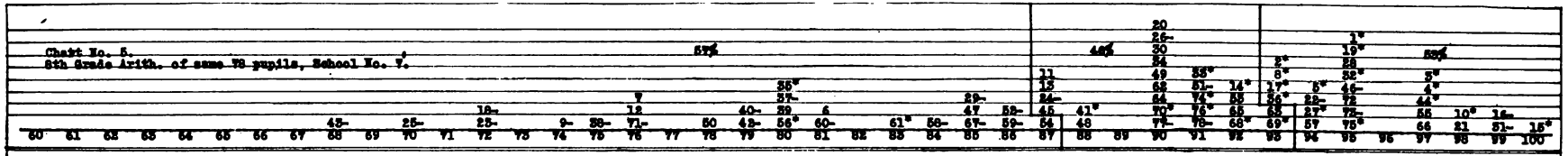


Chart No. 6.
7th Grade Arith. of 78 pupils, School No. 7.

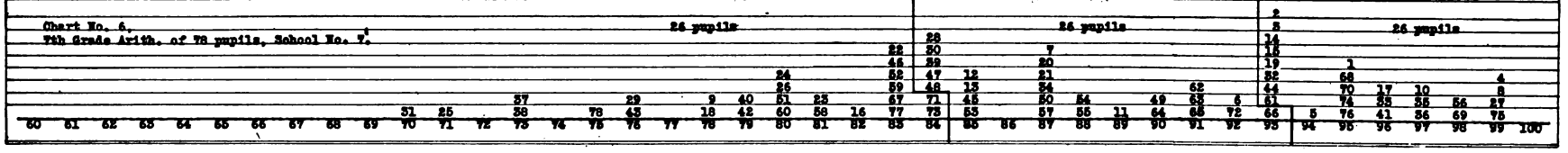


Chart No. 7.
8th Grade English of same 78 pupils, School No. 7.

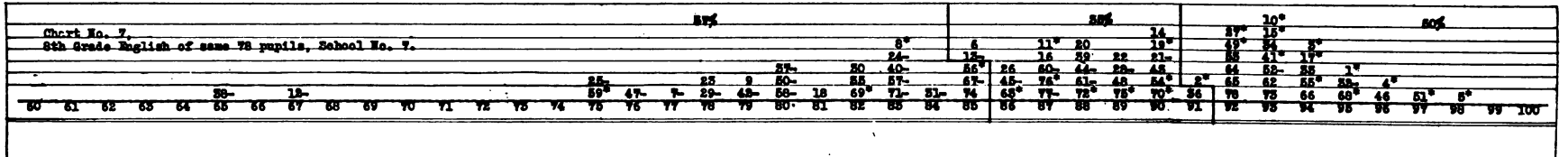
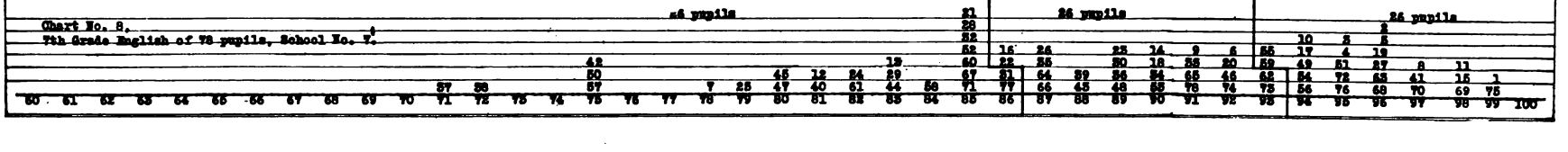


Chart No. 8.
7th Grade English of 78 pupils, School No. 7.



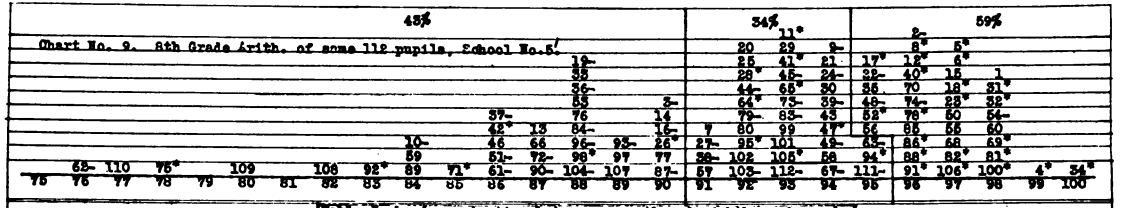
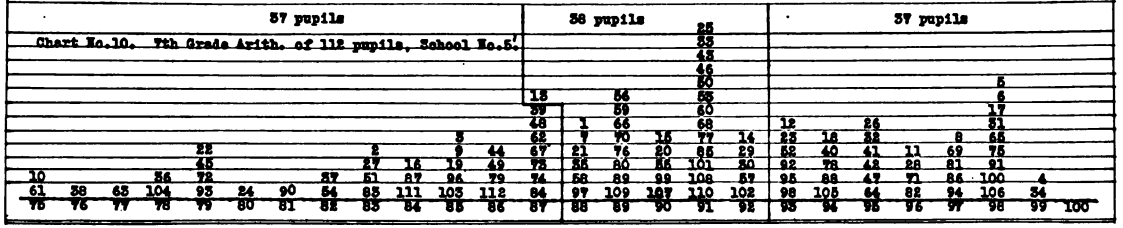


Table I showing retention between seventh and eighth grade work.

7th Grade		Hist.-School No.5' 8th Grade				Engl.-School No.5' 8th Grade				Engl.-School No.7' 8th Grade				Arith.-School No.5' 8th Grade				Arith.-School No.7' 8th Grade			
		1	2	3	Ter.Ret	1	2	3	Ter.Ret.	1	2	3	Ter.Ret.	1	2	3	Ter.Ret.	1	2	3	Ter.Ret.
	1	22	11	4	59.45	25	8	6	62.76	14	8	4	53.84	22	9	6	59.45	15	8	3	57.68
	2	11	15	12	39.49	11	17	10	44.84	10	10	6	35.74	10	13	15	34.21	6	13	7	46.42
	3	4	12	21	56.75	5	15	21	56.75	2	8	16	61.53	5	16	16	43.24	5	5	16	61.53
		Tot. Ret.			51.76	Tot. Ret.			54.46	Tot. Ret.			51.28	Tot. Ret.			45.53	Tot. Ret.			56.41



SEC. II. HIGH-SCHOOL COMPARISONS ONLY

The object in making the comparison within the high school was the same analogously as that stated for the comparison of the pupils within the grammar school. This first part of the comparison between the standings of pupils in different years and within the same subject was made in order to determine if possible the retention from year to year within the high school itself. For in order to be able to make any judgments as to what we should expect the retention to be between different institutions—as for example, between the grammar school and high school—it will be valuable to know what the retention is between the different years within the high school.

A very few comparisons have been made with respect to the relative standing of pupils between different subjects pursued within the high school during the same year. This will enable us to see whether the pupils who stand well, or mediocre, or poor, as they pass from one year to another within the same subject, also stand respectively the same in other subjects.

Charts 11–38 represent the marks of pupils in three different high schools in the subjects of English, Latin, and mathematics. The subjects are charted separately for the different years. English is traced throughout three years; that is, the standings of pupils in the first-year English are compared with the standings of the same pupils in the second year. The standings then of these pupils in their second year of high-school English are compared with their standings in the third-year English. In mathematics and Latin the comparison is made between only two different years of work, because reliable records were not available for a longer period of time. After the distributions in the different high schools were effected a composite was made for these subjects in the respective schools. It will be noted in charts 11, 12, 13 of school No. 8 that the range of the scale of grading differs from that in schools Nos. 5 and 9. But since so few individuals appear below 75 per cent it was thought unobjectionable to composite the three schools.

Some of the results of the first part of the comparison will now be discussed. In looking over charts 11–22 the distribution of the groups throughout the scale of grades is interesting, but one is tempted to ask whether it is justifiable. In general, the pupils are graded as a group somewhat lower in the Sophomore year than they are graded in the Freshman, and again somewhat lower in the Junior than in the Sophomore year. If the group is to be shifted at all—and it should be kept in mind that this is identically the same group throughout in each

school—might it not better have been done in the opposite direction? Is this to be accounted for by the fact that pupils do poorer work as they advance; or is it due to a different standard of grading; or is it due to the fact that only a part of all the students who took the work at any one time are here represented; or is it to be accounted for in other ways?

The group in charts 11–13 starts, as is seen in chart 11 with a mode about 90, becomes somewhat bimodal in the second year, with a minor mode at 83; this second mode is then shifted to 78 in the Junior year. The retention of pupils in their relative positions remains high despite the changing in the total appearance of the group, as may be seen in table III.

This same sort of shifting of the groups which has been pointed out in the charts 11–22 representing the marks in English also occurs in a general way throughout the Latin and mathematics work, as shown in the charts from 23–38. The distribution of the groups in the subject of Latin toward the lower end of the scale is clearly noticeable in schools Nos. 9 and 5, shown in charts 26 and 28. One-third of the pupils in chart 28 appear between 75–78 percentages inclusive in a scale from 75–100; and in chart 26, one-third between 75–79 percentages inclusive; and there is a peculiar bunching of grades in charts 23–26. In the subject of mathematics, school No. 8, as was the case in Latin, shows probably the least variation in its grouping of the same pupils in the Freshman and Sophomore years. As may be seen by comparing charts 33–34 with charts 31–32 and 35–36, a bimodal division in general is noticeable in the charts for mathematics, with some tendency to a rectangular distribution of grades.

Turning to the composite charts in English represented by Nos. 20, 21, 22, and also to the composite charts in Latin represented by Nos. 29 and 30, or to the composite charts in mathematics represented by Nos. 37 and 38, it may be seen that the grouping in the marks of successive years of the high school after the first year is always toward the lower end of the scale. But the variation is more extreme in the case of mathematics and Latin than in the case of English.

There is much discussion about the pupils of high schools being disposed to drop certain subjects because they prefer other subjects. Is it possible that the facts shown in such a chart as 30 or 38 explain some of the tendencies of pupils to drop certain subjects? What explanation, fair to the pupil, is to be offered in view of the different distributions of the groups in the subject of Latin as shown in charts 38 and 30?

Is this sort of grouping due to the difficulty of the subject itself? Is it due to the dulness of the pupils? Is it due to the fact that the subject is not taught as well in the second year? Is it due to a radically different standard of grading? Or is this shifting of the group to be explained apart from such factors as these? The facts, at any rate, justify an insistence on some sort of legitimate explanation.

The sort of distribution of grades in charts 25 and 26, and also in 27 and 28, might well enlist the attention of classical teachers who are interested in having the classics maintain their position in the high-school curriculum. What more effective means or ways could be found for discouraging pupils from pursuing further work in Latin than that employed in school No. 5? It is very improbable that there is any reasonable justification for handling pupils in such a manner as this. Although the students have kept the same rank in relation to each other to a fair extent, the absolute grade of a large number of pupils has been arbitrarily dropped in the second year's work. I say arbitrarily advisedly, because on what grounds can it be assumed that a group of this size, of over 200 pupils, as a group is less fitted for the work after a year of preliminary study than at the start? Since as a group their standards of work and effort have not changed, most probably it is merely an arbitrary change in the teachers' standards. The student who receives a considerably lower grade with the same expenditure of effort, and does not appreciate that his *rank* in the group has not changed materially, might very well conclude that Latin was not his forte and consequently drop it.

By referring to charts 40, 47, and 50, which appear in a later section, it may be seen that there is a difference in the distribution of grades in the Sophomore English, history, and mathematics. This group of 212 pupils shifts about from a skewed distribution in English toward the bottom of the scale up to a rather skewed distribution toward the top in the subject of history, and finally with a rather equal distribution of marks over the scale in the subject of mathematics. The modes in chart 50 are noticeably different from those in charts 40 and 47. The very frequent bimodal division occurs in chart 50 with a large number of marks over the lower limit of the scale.

The percentage of retention between the first-year and second-year English work in charts 11 and 12 for school No. 8 may be seen by referring to table III. The retention is higher between the second and third year of English than it is between the first and second year. One explanation of this may be that students upon entering the high school

need part of the first year to get accustomed to the new order of studies and practices.

Charts 14, 15, 16 represent the standings of pupils in a large high school not in Kansas.[1] The total retention in school No. 9 between the second and third year is higher than is the total retention between the first and second year of English. This is similar to the case above in school No. 8. The retention between the second and third year is higher, however, in the case of school No. 8 than in school No. 9. This may be due to the fact that the pupils in the former school are likely to have fewer distractions from school work. It may be that a more select group of pupils has been used than were chosen from the other schools, respectively. The retention in school No. 8 is also higher than in school No. 5. One probable reason for the lower retention in school No. 5 may be the crowded and cramped conditions of the schools, and consequently this involves something of the general administration of the school.[2] If we compare the table of charts 12 and 13 with the table of charts 18 and 19, however, we can get a measure of the *progress* from one tertile to another. For example, in school No. 8 eight pupils go from the lower third to the middle third in the Junior year and one pupil goes to the high third, while in school No. 5 twenty-eight pupils out of the lower third in the Sophomore year go up to the second third in the Junior year and five go up to the high third. So that measured in terms of progress made by pupils, high school No. 5 stands proportionately higher than high school No. 8 on the basis of a single subject.

Table III shows in the composite charts for English that the retention is higher between the Freshman and Sophomore year than between the Sophomore and Junior year. This is just the opposite of the results found in comparing the schools separately. But in these composite charts a group of pupils were taken from school No. 5 that were not originally included in this separate school comparison. So that this is one probable explanation of this higher retention between the first and second year, namely, that this later-added group of pupils were better adapted to the standards of the school and in particular to those of the individual teacher.[3]

[1] The graduates from school No. 9 are all from the school year of 1908–9. Some of them are mid-year graduates and some of them June graduates.

[2] The graduates who compose charts 17, 18, 19 are scattered from the years 1905 up to and including 1911.

[3] Such an adaptation as this may sometimes involve the changing of the previous standards, but if it brings more profitable results why would this not be a legitimate procedure?

From the tabulated results of the comparisons made between the same subjects in the different successive years, as shown in table III, it may be seen that the total retention is for the majority of the schools between 50 and 60 per cent according to the tertile method. The total retention for Latin between the first and second year of the high school

Table III, showing relative standings of H. S. pupils within the same subjects in different years.

Fresh. Eng.	H.S.No.8-Charts 11,12. Soph. Eng.				
	1	2	3	Ter. Ret.	
1	28	12	2	66.66	
2	13	18	11	42.85	
3	1	12	29	69.04	
	Tot. Ret.			59.52	

Soph. Eng.	H.S.No.8-Charts 12,13. Jun. Eng.				
	1	2	3	Ter. Ret.	
33	8	1	78.57		
8	26	8	61,94		
1	8	33	78.57		
	Tot.Ret.			73.01	

Fresh. Eng.	H.S.No.9 Charts 14,15 Soph. Eng.				
	1	2	3	Ter. Ret.	
32	16	6	60.39		
16	21	17	38,88		
5	17	31	58.49		
	Tot.Ret.			52.50	

Soph. Eng.	H.S.No.9 Charts 15,16 Jun. Eng.				
	1	2	3	Ter. Ret.	
33	12	8	62.17		
14	29	11	53.70		
6	13	34	64.15		
	Tot.Ret.			60.00	

Fresh. Eng.	H.S.No.5 Charts 17,18 Soph. Eng.				
	1	2	3	Ter. Ret.	
1	40	22	9	56.33	
2	23	25	22	35.71	
3	8	23	40	56.33	
	Tot. Ret.			49.52	

Soph. Eng.	H.S.No.5 Charts 18,19 Jun. Eng.				
	1	2	3	Ter. Ret.	
61	16	4	71.83		
15	29	26	41.42		
5	28	36	53.52		
	Tot.Ret.			55.66	

Fresh. Eng.	Composite of H S-Charts 20,21 Soph. Eng.				
	1	2	3	Ter. Ret.	
136	56	20	64.45		
61	84	66	39.76		
14	72	125	59.24		
	Tot.Ret.			54.50	

Soph. Eng.	Composite of H S-Charts 21,22 Jun. Eng.				
	1	2	3	Ter. Ret.	
131	59	21	62.08		
62	81	68	38.86		
18	71	122	57.81		
	Tot.Ret.			52.76	

Fresh. Lat.	H.S.No.8 Charts 23,24 Soph. Lat.				
	1	2	3	T.Ret	
1	30	8	0	79.47	
2	7	19	12	50.00	
3	1	11	28	68.42	
	Tot. Ret.			65.78	

Soph. Lat.	H.S.No.9 Charts 25,26 Soph. Lat.				
	1	2	3	T.Ret	
19	7	8	61.29		
10	13	7	43.33		
2	10	19	61.29		
	Tot.Ret.			54.63	

Fresh. Lat.	H.S.No.5 Charts 27,28 Soph. Lat.				
	1	2	3	T.Ret	
47	18	7	65.28		
20	28	25	31.36		
5	27	40	55.55		
	Tot.Ret.			52.99	

Soph. Lat.	Composite H.S. Nos. 8,9,5,0 Charts 29,30 Soph. Lat.				
	1	2	3	T.Ret	
107	36	14	68.58		
47	72	36	45.80		
13	48	95	60.89		
	Tot.Ret.			58.67	

Fresh. Math.	H.S.No.9 Charts 31,32 Soph. Math.				
	1	2	3	T.Ret	
1	25	10	4	64.10	
2	11	18	10	46.15	
3	3	11	25	64.10	
	Tot. Ret.			58.11	

Fresh. Math.	H.S.No.8 Charts 33,34 Soph. Math.				
	1	2	3	T.Ret	
23	15	4	54.76		
13	14	14	34.12		
6	13	23	54.76		
	Tot.Ret.			48.00	

Fresh. Math.	H.S.No.5 Charts 35,36 Soph. Math.				
	1	2	3	T.Ret	
48	17	6	67.60		
12	34	24	48.57		
11	18	42	59.15		
	Tot.Ret.			58.49	

Fresh. Math.	Composite H.S. Nos. 9,8,5 Charts 37,38 Soph. Math.				
	1	2	3	T.Ret	
121	52	23	61.72		
49	91	57	46.19		
26	54	116	59.17		
	Tot.Ret.			55.68	

is higher than for either English or mathematics. This may be due to the fact that the work done in first-year Latin connects better with the second year's work than in the case of the mathematics and English.

Another method besides the tertile method may profitably be used in showing the percentage of retention of pupils between the different years of the high-school work. It is the method, already indicated in sec. I, of finding the average of the percentages of those pupils in the

highest and lowest tertile of a group in one year of the high school who remain above or below the median, respectively, in the advance year's work. For illustration, in chart 11 there are 42 pupils in the higher and lower thirds, respectively. The median in chart 12 occurs at about 89. Of the starred people who come from the high third in chart 11, 37 remain above this median. If 37 is divided by 42, the retention for the upper third is 88.09 per cent; and for the lower third it is also 88.09 per cent. The average of the retentions of the upper and lower third in this case is then 88.09 per cent.

Now on the basis of this method number two, or the modified median method, there is a retention of about 80 per cent in the comparisons made between the different subjects within high school No. 5; of about 85 per cent in school No. 8; of about 75, in school No. 9. For actual percentage see footnote below.[1] When the composite charts for the subjects of English, mathematics, and Latin are considered, the percentages are similar.[2]

It was thought that it would be suggestive to try out a few comparisons between the different subjects within the high school, as was done within the grammar school. In the comparison of the grammar school, high school, and college, later on in this thesis, it will be observed that the subject of English is largely used as the basis, and chiefly because no other subject is likely to be studied so continuously for a period of years. In view of using English as the basis of comparison, it seemed desirable, as indicated above, to make some comparisons between the standing of pupils in English and their standing in other subjects. The comparisons here made are very brief and will need to be carried farther in order to get conclusions that will be valid in any extensive way. However, the groups considered are large enough to be suggestive at any rate.

[1] The actual percentage of retention for school No. 5 between the first- and second-year English is 76.05; between the second- and third-year English, 80.84; between first- and second-year Latin, 81.24; and between first- and second-year mathematics, 76.80. In school No. 8, between first- and second-year English, 88.09; between second- and third-year English, 90.47; between first- and second-year Latin, 86.83; between first- and second-year mathematics, 71.42. In school No. 9, between first- and second-year English, 72.63; between second- and third-year English 75.45; between first- and second-year Latin, 70.96, and between first- and second-year mathematics, 87.17.

[2] In the composite charts of the three schools the actual percentage of retention between the first- and second-year English is 78.40; between second- and third-year English, 79.38; between first- and second-year Latin, 82.04, and between first- and second-year mathematics, 75.50.

Table IV shows a summary of some comparisons made in the subjects of English, Latin, science, mathematics, and history. Most of the pupils considered are represented in school No. 5. The charts are not presented in this thesis.

While it would be more significant to compare the results of science and mathematics to that of English and mathematics within the same school, yet it is of some importance to note that the relation between science and mathematics in school No. 9 is somewhat closer than that between English and Latin in school No. 5, and also closer than between English and mathematics in school No. 5. As table IV shows, the relation

	H. S. No. 5					H. S. No. 5					H. S. No. 5					H. S. No. 9				
	Fresh. Math.					Fresh. Lat.					Soph. Hist.					Fresh. Math.				
Fresh. Eng.	1	2	3	Ter. Ret.		Fresh. Eng.	1	2	3	Ter. Ret.	Fresh. Eng.	1	2	3	Ter. Ret.	Fresh. Science	1	2	3	Ter. Ret.
1	37	22	12	62.11		1	38	14	19	62.29	1	39	23	9	64.92		33	12	8	62.26
2	22	23	25	32.85		2	16	27	17	46.00	2	24	26	21	35.71		10	27	15	50.00
3	10	25	36	80.70		3	7	19	35	87.37	3	8	22	41	87.74		8	15	30	56.60
	Tot. Ret.			45.23			Tot. Ret.			54.94		Tot. Ret.			49.62		Tot. Ret.			56.26

TABLE IV

Shows relation between different subjects within the high school.

between English and history in school No. 5 is higher than that between the English and mathematics. However, the differences in retention between these various subjects are not after all so great as to warrant the conclusion so often made that the majority of pupils who are either good or mediocre or poor are likely to be strongly the reverse in other subjects.[1] For when the average of the percentages of those pupils from the higher and lower tertiles who stay above or below the median is secured, the result in the majority of the comparisons made is a retention of over 75 per cent.[2]

On the basis of the results of the comparisons made between the same subjects in different years within the high school, and on the basis of the brief comparisons made between different subjects within the high school,

[1] The above results agree with the conclusion of Walter R. Miles in an article on "A Comparison of Elementary and High-School Grades." "The rank which" a pupil "receives in any one subject will represent the rank which he receives in all subjects" (p. 22).

[2] The actual percentage of retention expressed in terms of the median method is for school No. 5, between Freshman English and Freshman Latin, 78.68; between Freshman English and Sophomore history, 77.46; for school No. 9, between Freshman science and Freshman mathematics, 72.62.

it is fair to conclude that there is in actual practice a retention within the high school of approximately 80 per cent.

The above result is stated in terms of the modified median method. On the other hand, based on the results of the comparisons made between the same subjects and between different subjects, according to the "tertile group" method, there is a retention of at least between 50 and 60 per cent within the high school itself.

By means of a diagram it is possible to get another measure of retention not necessarily in terms of percentage. Diagram II shows not only how many persons are retained straight through three years of English work, but it also shows the amount of shifting and retention that has occurred within the groups—high, middle, or low, respectively.

Diagram II for school No. 8 shows that 24 pupils went through three years' work without going out of the high tertile and also 24 other pupils went through the same number of years without going out of the lower tertile group; 28 pupils out of the 42 in the high tertile of the first year's work remain in the high tertile of the second year's work; 12 of these same pupils pass down to the second tertile; and 2 of them, to the third tertile in the second year's work.

The diagram is simple, providing the reader keeps in mind that by a glance it may be seen that the arrangement of the numbers in the second year's work, namely, 29, 11, and 2, in the lower tertile indicates that 2 pupils have come from the high third, 11 from the middle third, and 29 from the lower third of the first year's work. The tertiles at the top of the diagram are divided into three sections, which may be seen and interpreted at a glance. For illustration, the numbers 24, 9, and 1, representing pupils in the third year, indicate that these pupils have come from the lower tertile of the second year's work; 4, 3, and 1, or a total of 8, have come from the middle group of the second year.

A convenient means of indicating what happens to any one pupil is by the use of figures placed opposite the numbers that represent different pupils. For example, let 46–1, 46–1, 46–1 indicate the fact that this pupil has maintained his position within the high third of the group throughout the three years of work. Similarly, let 24–2, 24–2, 24–2, or 27–3, 27–3, 25–3, indicate the position of two other pupils in the middle and lower groups throughout three years of English work. The following is a summary way of indicating the positions of 126 pupils throughout the three years of high-school English. From such a table as this it is a simple matter to construct the above-mentioned diagram.

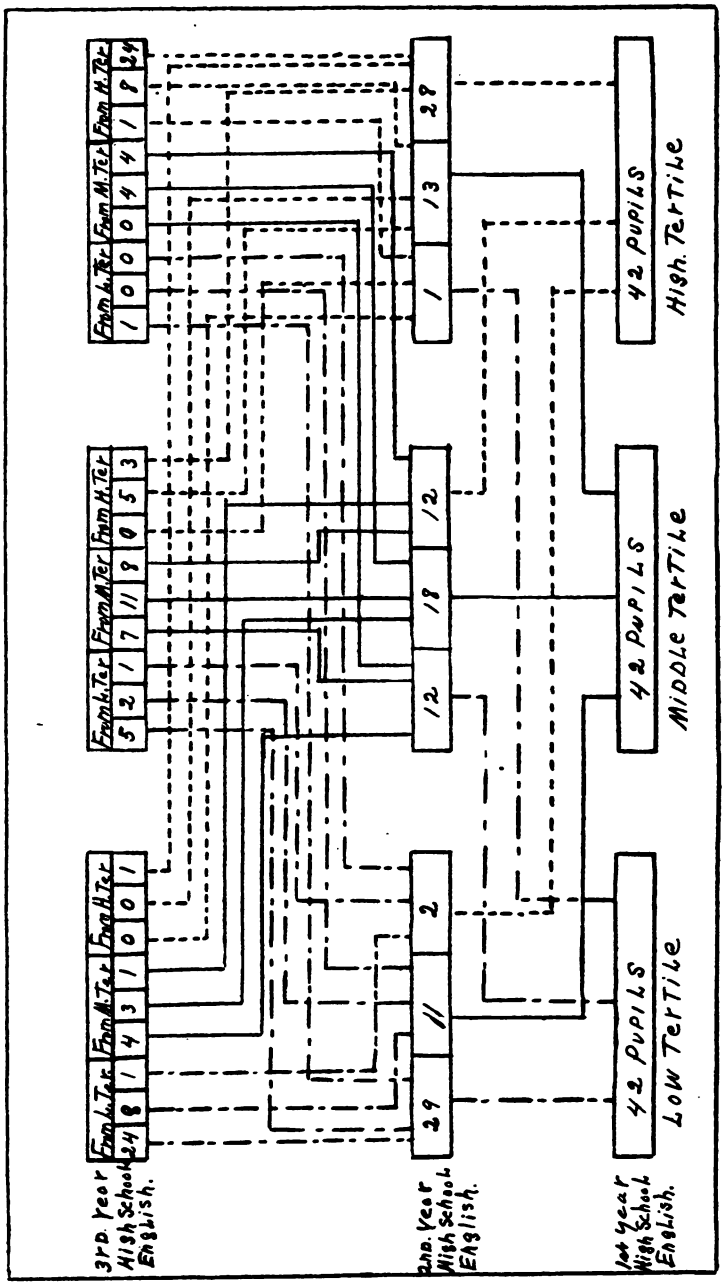


DIAGRAM II

Showing the group retention of 126 pupils through three years of high-school English

This tabulated scheme shows not only the standing of the class as a whole, but any one individual's relative standing in the three years' work can be seen at a glance.

Both the diagram and this scheme show clearly that proportionately more of the upper- and lower-third pupils pass straight through than

Relation of the lower tertile of first year English to second and third year English				Relation of the middle tertile of first English to second and third year English				Relation of the high tertile of the first year English to second and third year English			
24	3	3	3	29	2	2	2	46	1	1	1
5	3	3	3	31	2	2	2	72	1	1	1
103	3	3	3	50	2	2	2	74	1	1	1
112	3	3	3	70	2	2	2	79	1	1	1
120	3	3	3	101	2	2	2	47	1	1	1
125	3	3	3	106	2	2	2	49	1	1	1
4	3	3	3	114	2	2	2	71	1	1	1
105	3	3	3	68	2	2	2	80	1	1	1
109	3	3	3	94	2	2	2	51	1	1	1
58	3	3	3	107	2	2	2	76	1	1	1
13	3	3	3	35	2	2	2	77	1	1	1
118	3	3	3	90	2	2	1	2	1	1	1
1	3	3	3	27	2	2	1	22	1	1	1
36	3	3	3	19	2	2	1	87	1	1	1
116	3	3	3	96	2	2	1	93	1	1	1
15	3	3	3	14	2	2	3	59	1	1	1
25	3	3	3	43	2	2	3	67	1	1	1
104	3	3	3	23	2	2	3	89	1	1	1
34	3	3	3	100	2	1	1	48	1	1	1
84	3	3	3	30	2	1	1	88	1	1	1
55	3	3	3	33	2	1	1	69	1	1	1
121	3	3	3	82	2	1	1	83	1	1	1
28	3	3	3	97	2	1	1	40	1	1	1
61	3	3	3	113	2	1	1	26	1	1	1
91	3	3	1	92	2	1	1	111	1	1	2
9	3	3	2	95	2	1	1	117	1	1	2
21	3	3	2	119	2	1	2	110	1	1	2
65	3	3	2	39	2	1	2	86	1	1	3
53	3	3	2	78	2	1	2	54	1	2	1
56	3	3	2	64	2	1	2	52	1	2	1
98	3	1	1	115	2	1	2	75	1	2	1
99	3	2	2	45	2	1	2	81	1	2	1
102	3	2	2	17	2	3	2	85	1	2	2
6	3	2	2	124	2	3	3	60	1	2	2
10	3	2	2	73	2	3	3	66	1	2	2
108	3	2	2	122	2	3	3	32	1	2	2
37	3	2	2	12	2	3	3	62	1	2	2
57	3	2	3	123	2	3	3	63	1	2	2
8	3	2	3	126	2	3	3	11	1	2	2
16	3	2	3	38	2	3	3	20	1	2	2
41	3	2	3	44	2	3	3	42	1	2	3
3	3	2	3	18	2	3	3	7	1	3	3

is the case in the middle group. It is possible, therefore, to determine in many cases what pupils are likely to do after their first year of high-school work by such a graphic scheme as this. For it has been seen that a large proportion of the pupils who do well, mediocre, or poor in the first year of high-school English are likely to be similarly grouped in the other years of their high-school English.

Chart No. 13. Jun. Eng. of the same 126 pupils, High School No. 8.
Chart No. 12. Soph. Eng. of the same 126 pupils, High School No. 8.
Chart No. 11. Fresh. Eng. of 126 pupils, High School No. 8.
42 pupils

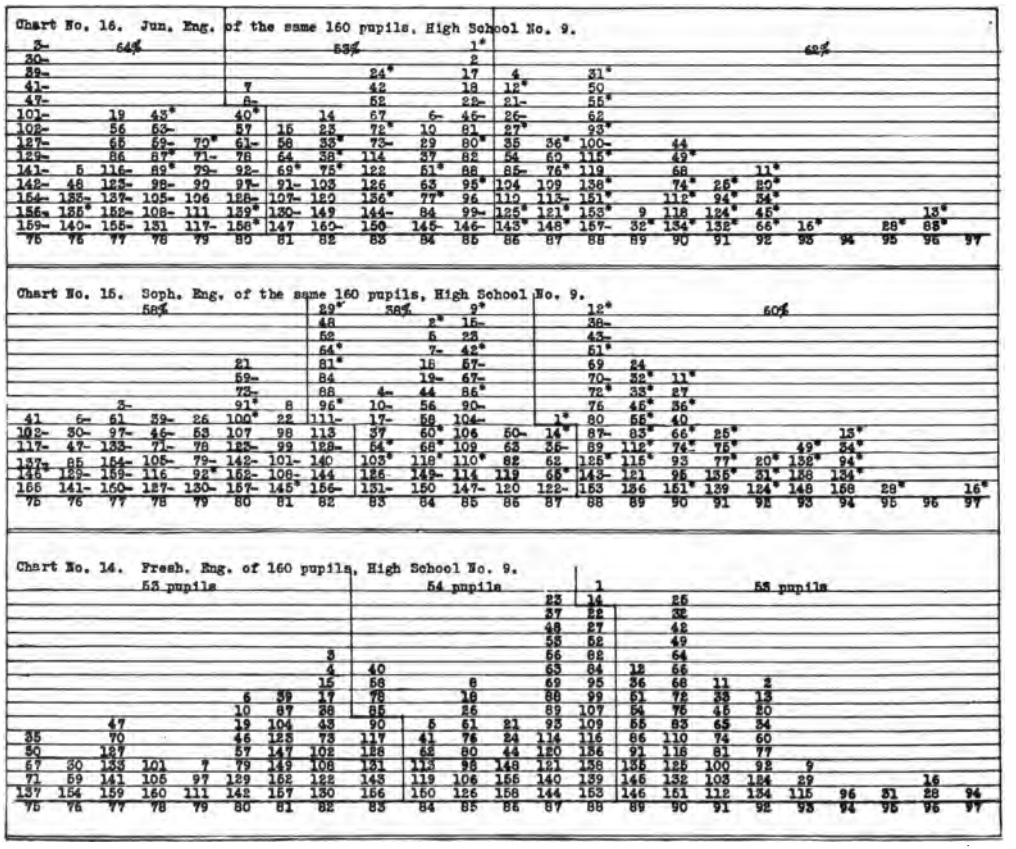


Chart No. 16. Jun. Eng. of the same 160 pupils, High School No. 9.

Chart No. 15. Soph. Eng. of the same 160 pupils, High School No. 9.

Chart No. 14. Fresh. Eng. of 160 pupils, High School No. 9.

Chart No. 19. Jun. Eng. of the same 212 pupils, High School No. 5.

	53%						11*	41%								71%						
							13-															
							30*															
							37*															
							39															
							63															
							95															
							103*															
		8					106-															
22-		38-					111-															
28-		46					113-						19									
54		61-	45-			9	122-			51	23*		33*									
62-	7	75	70-	1		31-	137	17*		88*	34*		40*									
68-	24-	101	71-	25	6-	44*	145	91-	43	115-	60	42*	74									
69*	41	114	72-	27-	10-	84	146	92	58-	117-	97	50	89*									
83-	47	120	77	33	29*	85*	149-	110*	67-	129	98	57*	108-		5*							
87-	52	127-	81	53-	48-	105-	158	150	107*	131	125	73-	116*	2	15*			12*				
93-	55-	134-	102	64	49-	112-	180-	163	118	160*	138*	96*	130*	4*	56*			20*				
128-	100	135-	109-	126	80	124-	182	167-	155	191*	143*	121*	156*	16*	78*	18*	66*	21*				
166-	104-	144	119	136	90-	139-	183	187*	159-	192-	173*	123-	162	26	99	55*	76	36*				
181-	142	154-	188*	172*	148	140-	190	189	178*	198*	174*	165*	170	32*	168*	79*	94*	147*				
185	152-	175-	197-	194	151	164*	195	200	186-	203	177-	176-	171	59	204*	86*	132*	169*			14*	
193-	153-	199-	201-	208-	161-	211-	202-	212-	206-	205	209*	184*	179*	210*	207*	133*	157*	196*	3*		141*	82*
75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97

Chart No. 18. Soph. Eng. of the same 212 pupils, High School No. 5.

					24*		35-		1*													
	56%				27		39		25-	35%						56%						
					38-		46-	7-	43-													
					45		47-	8-	54			11-										
					48-	10-	51*	9-	59*			16										
					53-	49-	63-	41*	60*			23										
		22*			73-	104	77-	52-	102*			29-	4*		17							
		28-			106*	105	81	74*	114	26-		30-	40*		21*							
		55			108*	112	84-	75-	118*	50*		34*	85		33*							
		68*		13-	111	117*	119	76	131-	64	2	57*	110*		37*							
6		72-		31-	140	122	120*	95	142-	80	19	69-	116*		42*							
58-		109		51-	149-	134-	129*	97*	162	99*	92*	78	132*	44	66*		3*					
70-		113		62-	152-	139	136-	144	182*	100	98*	89	156*	86*	121*	18*	32*	12*				
71-		115-		90-	154	153	146-	145	183-	137-	101	96	167	88	133*	36*	143*	14*				
87-	83-	124	67	186*	186-	159-	150	189	185-	148	125*	103-	172	94	168*	56	169	20*				
91-	93-	127-	123*	166-	197	175	158	194	190-	151*	163	107*	191	130*	174*	141*	173*	65*	5			
128-	180-	177	135-	199	202-	192	167-	206	195*	165-	170	138*	198	164	204	184*	179-	160	15	147*		
193-	161-	212-	161-	201-	208-	211-	176*	206*	200	203*	171*	188-	210	165-	207	209*	187*	178*	79*	196*	82*	
75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97

Chart No. 17. Fresh. Eng. of 212 pupils, High School No. 5.

															1							
		71 pupils						70 pupils		5					21			71 pupils				
										6					36							
										15					50							
										17					68							
28		7								19	23			33	74							
31		38								76	44		18	41	79							
53		61					27			78	67		20	51	86							
58		69		9		26	54		59	124	105		22	99	92							
62		75	8	10	43	47	55		64	139	122		24	102	97		3					
65		87	29	30	46	48	89	16	80	153	145	2	40	107	106		4					
73		142	35	71	49	52	95	56	81	163	148	45	42	108	116	34	98	12				
83		166	157	72	77	70	96	114	88	164	169	100	59	110	118	37	141	32				
156	11	180	146	93	115	90	112	154	101	172	194	104	85	120	138	117	143	60				
149	13	186	152	127	128	91	113	158	109	175	191	140	94	126	156	121	151	123	57	66		
161	25	193	183	131	134	103	119	170	144	177	200	150	111	129	195	125	168	147	65	133		
181	84	202	188	179	135	155	167	192	162	189	207	198	157	176	205	130	182	156	82	178		14
185	165	211	201	208	212	159	190	199	205	197	210	204	160	206	209	171	187	175	174	184		196
75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97

Chart No. 20. Fresh. Eng. of 633 pupils, a composite of High Schools No's. 8, 9, 5.

211 pupils | 211 pupils | 211 pupils

Score	Pupils (top to bottom)
70	530
71	
72	
73	511, 609, 618, 626, 631
74	510, 611, 615
75	2, 6, 75, 85, 115, 116, 161, 164, 186, 191, 195, 196, 208, 218, 271, 284, 296, 316, 320, 382, 397, 414, 418, 483, 515, 564, 605
76	91, 143, 145, 158, 219, 300, 377, 406, 500, 519, 527, 563, 608, 624
77	12, 21, 69, 77, 139, 171, 194, 204, 210, 222, 277, 301, 316, 321, 328, 337, 346, 394, 417, 473, 479, 487, 505, 507, 542
78	17, 32, 46, 65, 140, 162, 168, 272, 281, 287, 318, 323, 336, 448, 452, 506, 514, 604, 622
79	22, 79, 141, 142, 163, 206, 207, 228, 262, 266, 314, 343, 354, 444, 458, 521, 531, 562, 610
80	7, 68, 72, 82, 107, 121, 125, 130, 176, 179, 182, 212, 250, 263, 269, 270, 347, 353, 357, 366, 393, 404, 426, 475, 488, 540, 597
81	15, 25, 26, 52, 57, 62, 84, 103, 159, 180, 181, 185, 205, 225, 226, 238, 290, 294, 386, 434, 451, 469, 493, 495, 498, 503, 512, 590
82	3, 19, 83, 99, 124, 131, 160, 187, 188, 200, 224, 230, 231, 247, 248, 254, 302, 325, 350, 351, 362, 364, 385, 390, 420, 449, 465, 476, 509, 516, 571, 614, 633
83	23, 34, 40, 97, 98, 148, 189, 249, 289, 293, 305, 327, 334, 367, 405, 425, 432, 437, 464, 474, 477, 489, 502, 522, 543, 547, 569, 567
84	4, 16, 33, 42, 53, 65, 81, 87, 100, 172, 197, 215, 216, 223, 236, 244, 279, 297, 340, 352, 388, 409, 460, 466, 496, 518, 534, 541, 561, 627
85	31, 39, 44, 80, 86, 108, 109, 113, 117, 120, 129, 137, 138, 147, 149, 151, 152, 202, 211, 213, 259, 274, 288, 298, 299, 307, 310, 312, 324, 332, 355, 365, 373, 408, 423, 427, 445, 453, 472, 520, 579, 606, 628
86	48, 63, 78, 105, 119, 122, 156, 177, 201, 240, 257, 280, 283, 304, 326, 329, 335, 342, 345, 368, 371, 391, 494, 501, 504, 529, 596, 598, 601, 630
87	13, 18, 49, 70, 74, 92, 104, 110, 118, 128, 134, 178, 235, 239, 275, 285, 333, 339, 370, 384, 395, 400, 403, 410, 416, 435, 436, 440, 461, 467, 468, 486, 490, 524
88	1, 11, 14, 29, 30, 36, 38, 60, 66, 71, 90, 93, 150, 153, 155, 157, 173, 175, 192, 220, 229, 246, 292, 295, 348, 361, 369, 374, 399, 429, 431, 442, 446, 454, 456, 463, 482, 484, 485, 499, 523, 525, 533, 544, 550, 613
89	27, 37, 64, 106, 166, 174, 184, 234, 237, 242, 243, 245, 255, 261, 264, 311, 341, 359, 383, 398, 401, 402, 433, 438, 481, 491, 492, 545, 549, 551, 574, 584, 600, 602, 621, 629, 632
90	20, 28, 54, 73, 88, 89, 94, 95, 111, 133, 154, 169, 183, 203, 209, 214, 221, 227, 232, 241, 251, 253, 267, 273, 330, 338, 344, 372, 379, 389, 396, 411, 413, 415, 419, 422, 430, 457, 465, 471, 476, 497, 517, 526, 532, 535, 536, 537, 539, 556, 570, 576, 588, 603, 607, 612, 619, 620, 625
91	9, 24, 43, 47, 51, 59, 118, 167, 170, 252, 256, 260, 265, 306, 358, 380, 392, 412, 421, 428, 447, 450, 459, 513, 546, 569, 616
92	56, 61, 125, 135, 136, 233, 276, 278, 286, 303, 317, 322, 349, 360, 367, 381, 407, 424, 470, 480, 538, 568, 575, 589, 623
93	41, 45, 58, 101, 126, 127, 144, 165, 193, 258, 282, 291, 308, 356, 376, 439, 462, 554, 566, 572, 594, 617
94	5, 8, 35, 190, 198, 217, 309, 443, 558, 565, 573, 581, 587, 591, 595
95	10, 50, 67, 76, 114, 199, 268, 313, 319, 378, 508, 528, 548, 560, 592, 593, 599
96	102, 132, 363, 375, 557, 582, 583
97	96, 146, 331, 441, 586
98	553, 555, 577
99	
100	552, 578, 580, 585

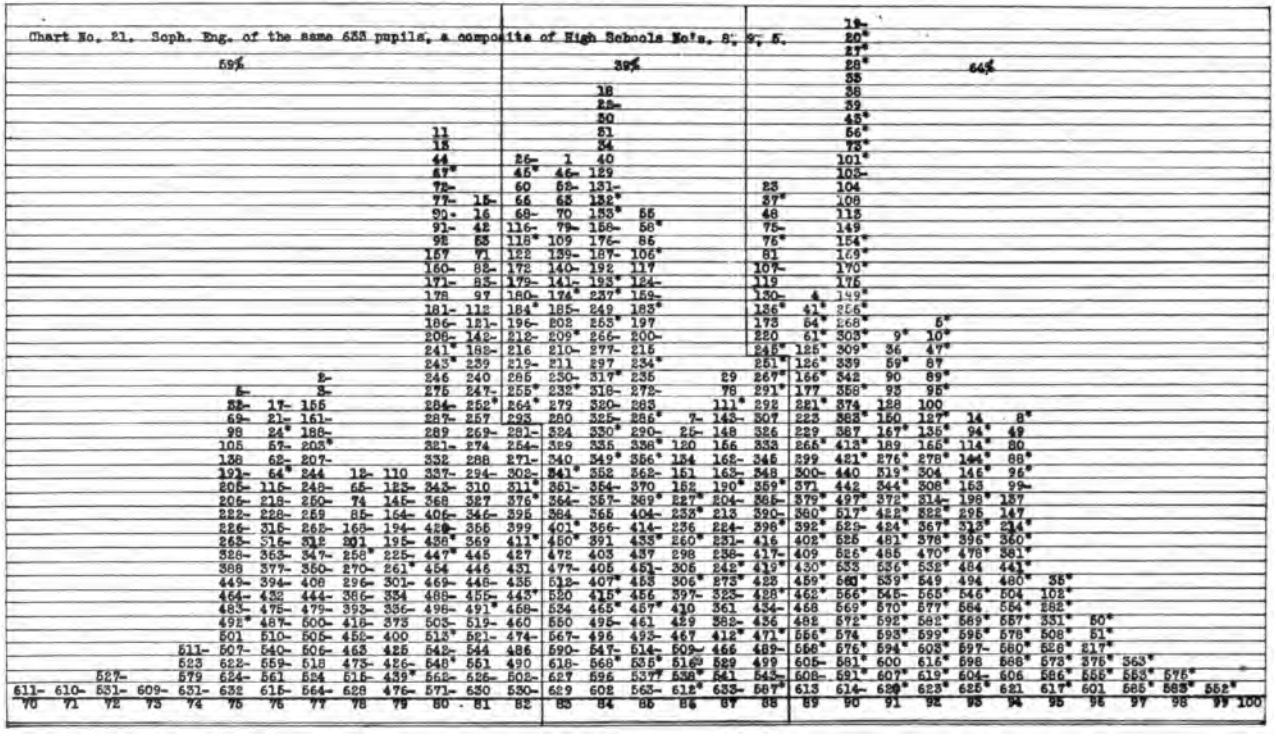


Chart No. 21. Soph. Eng. of the same 655 pupils, a composite of High Schools Nos. 8, 9, 5.
59%
39%
64%
70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

Chart No. 22. Jun. Eng. of the same 633 pupils as composite of
High Schools No's. 8,9,6.

Chart No. 26. Soph Latin of the same 93 pupils, High School No. 9.

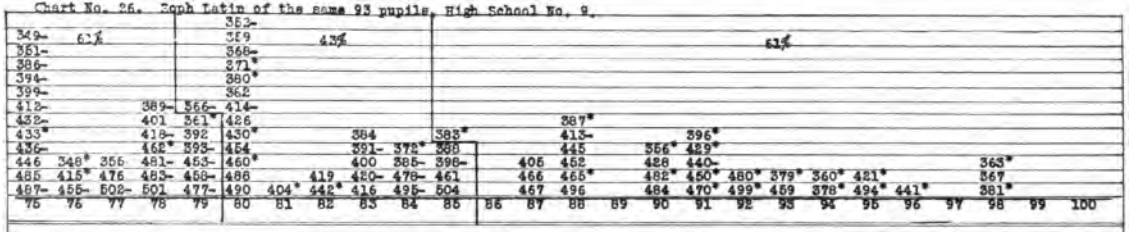


Chart No. 25. Fresh. Latin of 93 pupils, High School No. 9.

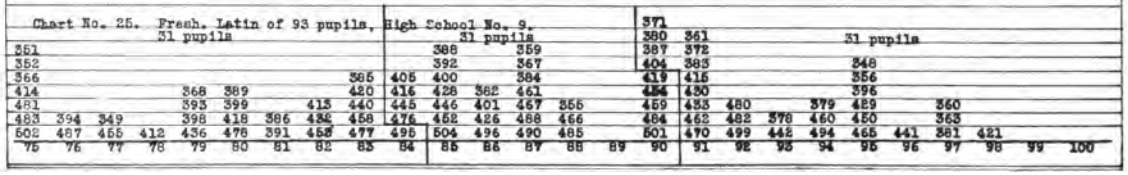


Chart No. 24. Soph Latin of the same 114 pupils, High School No. 8.

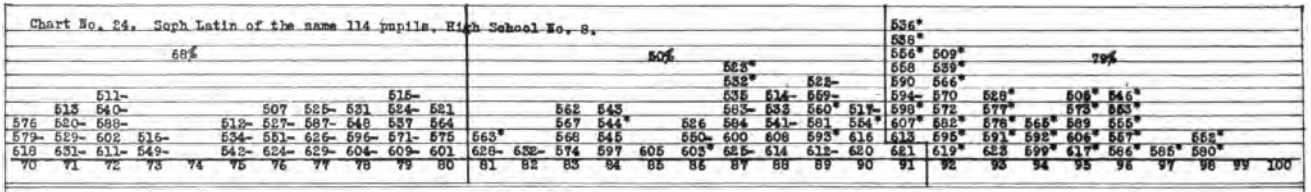


Chart No. 23. Fresh. Latin of 114 pupils, High School No. 8.

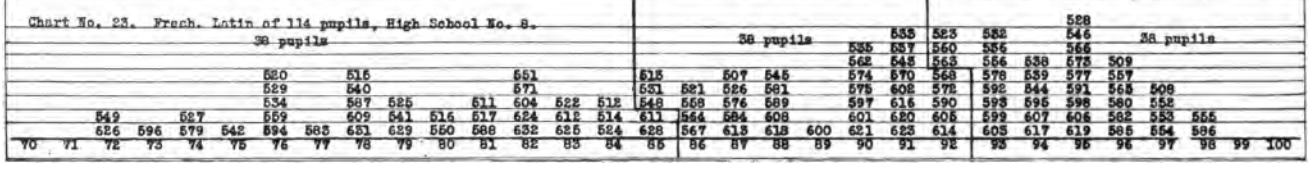


Chart No. 26. Soph. Latin of the same 217 pupils, High School No. 5.

55% 31% 65%

Chart No. 27. Fresh. Latin of 217 pupils, High School No. 5.

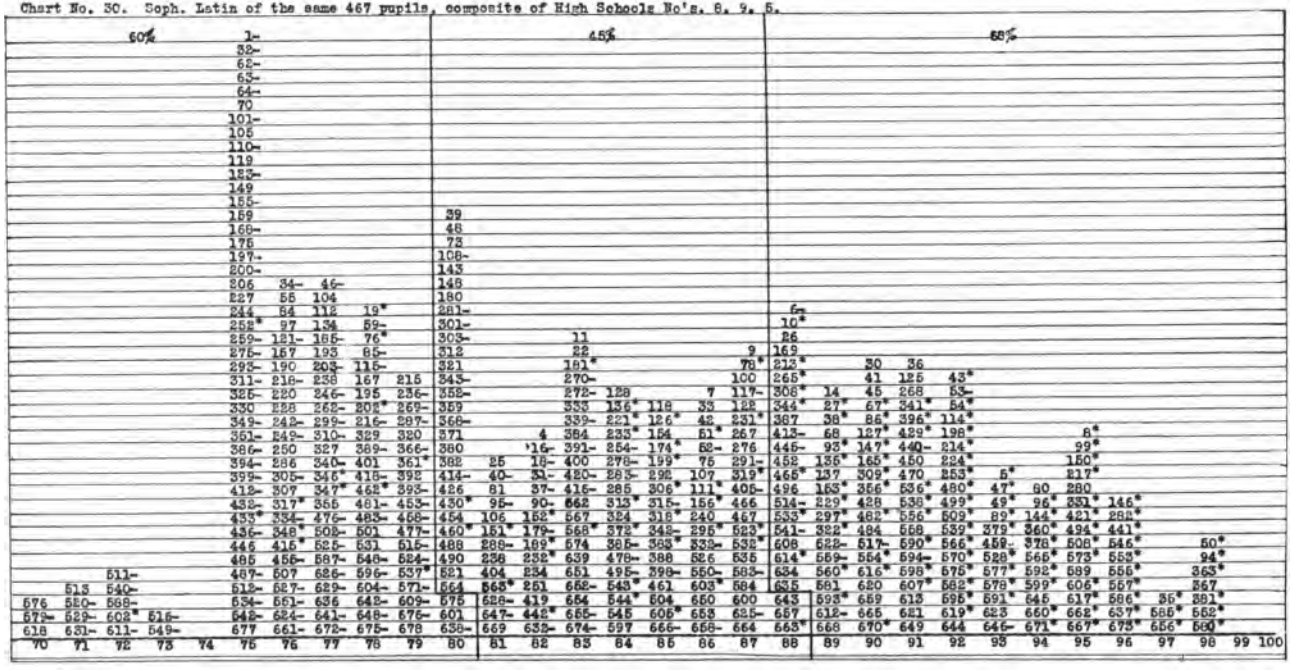
72 pupils 73 pupils 72 pupils

Chart No. 29. Fresh Latin of 467 pupils, composite of High Schools No's. 8, 9, 6.

156 pupils (70–84) · 155 pupils (85–90) · 156 pupils (91–100)

Score	Numbers (top to bottom)
70	
71	
72	549, 626
73	596
74	527, 579
75	6, 34, 65, 115, 155, 218, 242, 275, 281, 283, 293, 301, 343, 351, 352, 366, 414, 481, 483, 502, 542, 652
76	16, 64, 121, 332, 394, 467, 520, 529, 534, 559, 594, 674
77	59, 108, 123, 262, 315, 349, 455, 583
78	95, 165, 197, 412, 515, 540, 567, 609, 631, 641, 675
79	1, 90, 236, 270, 272, 334, 368, 393, 398, 456, 585, 541, 629
80	32, 37, 46, 278, 299, 303, 305, 311, 389, 399, 418, 476, 516, 550, 661
81	18, 40, 65, 249, 269, 288, 291, 340, 386, 391, 511, 517, 568, 642, 676
82	101, 117, 200, 203, 259, 287, 413, 432, 463, 551, 571, 604, 624, 682
83	52, 110, 168, 179, 254, 339, 342, 385, 420, 440, 458, 477, 522, 612, 625, 638, 646, 647, 648, 655, 658, 666, 672
84	31, 53, 62, 216, 246, 310, 325, 405, 416, 445, 476, 495, 512, 514, 524
85	7, 26, 33, 46, 70, 75, 80, 112, 159, 167, 238, 388, 392, 400, 428, 446, 452, 504, 513, 531, 548, 611, 628
86	45, 84, 104, 105, 118, 157, 180, 195, 244, 286, 321, 329, 362, 401, 426, 496, 521, 558, 564, 567, 653, 654, 657, 677, 678
87	22, 39, 41, 68, 73, 125, 149, 193, 206, 220, 227, 285, 292, 327, 330, 359, 367, 384, 461, 467, 488, 490, 507, 526, 576, 584, 613
88	4, 11, 42, 106, 107, 128, 134, 164, 175, 228, 240, 250, 268, 320, 333, 355, 466, 485, 546, 581, 589, 608, 618, 634, 635, 636, 639, 650, 669
89	9, 14, 36, 55, 81, 97, 119, 143, 215, 267, 276, 280, 307, 324, 338, 600
90	25, 30, 100, 122, 137, 148, 169, 190, 234, 251, 312, 371, 380, 387, 404, 419, 454, 459, 464, 501, 535, 562, 574, 575, 597, 601, 621, 644
91	38, 43, 89, 127, 136, 150, 174, 231, 232, 252, 253, 317, 344, 361, 372, 383, 415, 430, 433, 462, 470, 533, 537, 543, 570, 602, 616, 620, 623, 643, 645, 649, 651, 659, 664, 665, 668
92	5, 8, 10, 19, 50, 86, 111, 126, 165, 169, 213, 221, 295, 308, 313, 480, 482, 499, 523, 560, 563, 568, 572, 590, 605, 614
93	47, 49, 93, 114, 153, 156, 199, 202, 306, 347, 378, 442, 532, 536, 556, 578, 592, 593, 599, 603, 637, 660
94	27, 51, 54, 78, 94, 147, 151, 152, 181, 196, 214, 224, 233, 297, 318, 322, 331, 346, 379, 460, 494, 538, 539, 544, 596, 607, 617
95	76, 99, 135, 265, 309, 319, 341, 348, 356, 396, 429, 460, 465, 528, 546, 566, 573, 577, 591, 598, 606, 619, 663, 670, 671
96	229, 441, 509, 557, 565, 580, 582, 585, 656, 662, 667
97	55, 67, 144, 217, 360, 363, 381, 508, 552, 553, 554, 673
98	146, 282, 421, 555, 586
99	96
100	

Chart No. 30. Soph. Latin of the same 467 pupils, composite of High Schools Nos. 6, 9, 5.



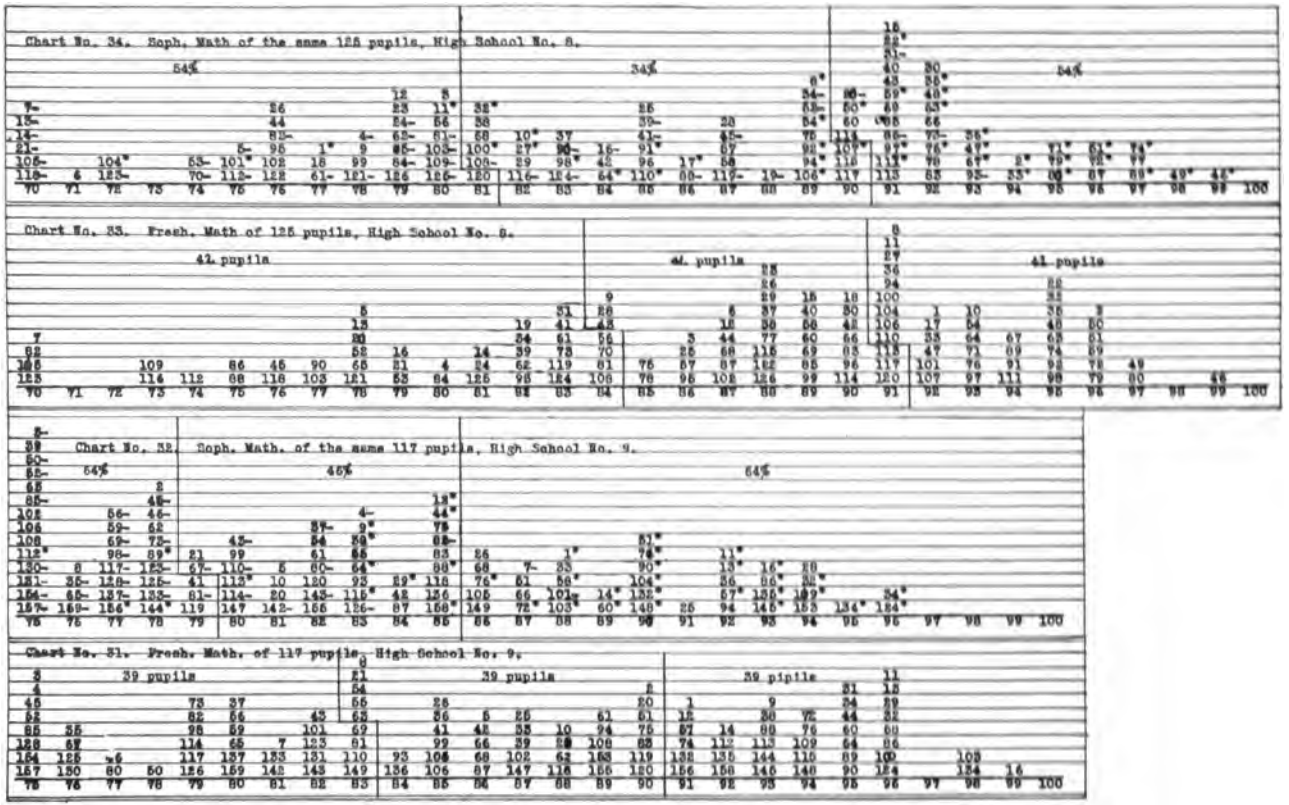


Chart No. 34. Soph. Math of the same 125 pupils, High School No. 8.
Chart No. 33. Fresh. Math of 125 pupils, High School No. 8.
42 pupils
41 pupils
41 pupils
Chart No. 32. Soph. Math. of the same 117 pupils, High School No. 9.
Chart No. 31. Fresh. Math. of 117 pupils, High School No. 9.
39 pupils
39 pupils
39 pipils

Chart No. 36. Soph. Math. of the same 212 pupils, High School No. 6.

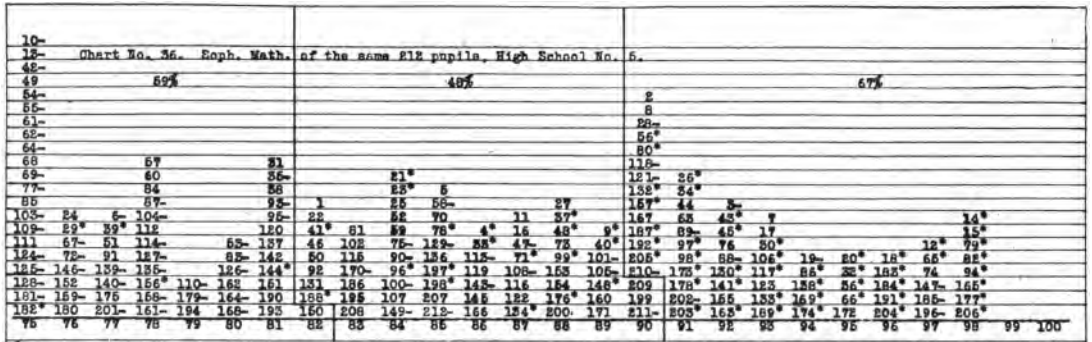


Chart No. 35. Fresh. Math. of the 212 pupils, High School No. 6.

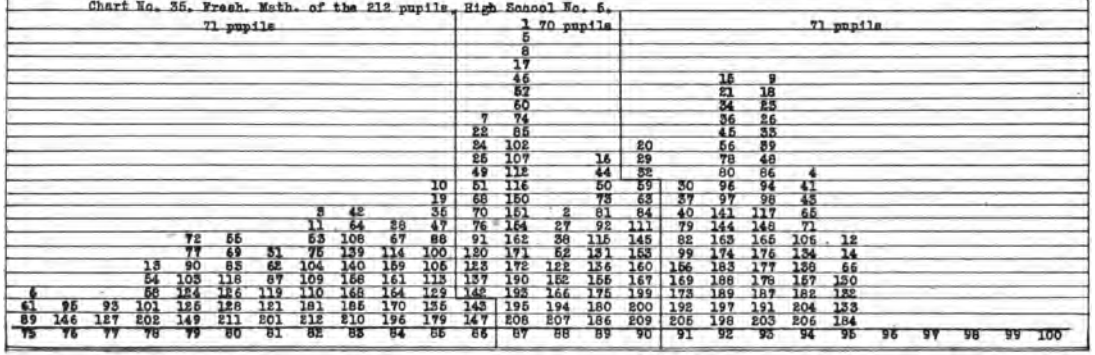


Chart No. 37. Fresh. Math. of 500 pupils composite of High School No's. 9, 10, 11.
196 pupils
197 pupils
196 pupils

Chart No. 38. Soph Math. of the same 589 pupils composite of High Schools No's. 9,8,5.

59% 46% 61%

70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
					5																									
					6-																									
					11*																									
					20*																									
					58-																									
					68-																									
					111																									
					132*																									
					142																48-									
					145-																61*									
					175-																88-									
					182																59*									
					187-																82*									
					186-																83-									
					194-																89*									
					197-			16-							29						108-									
					203			23-							33						109*									
					204-			44-							70						134		30							
					212-			57-							101*						140		47*							
					220			63							113-						161-		56*							
					238-			76*							125*						189*		64							
					244-			110					34	17		131-						215*	21*	67*							
					246			190			37		53-	18-	14*	137						253-	94*	76*							
					259-			193			42*	66	61	38	22-	291-					128*	256-	169*	117						
					260-			219			72-	98*	100	71-	46-	205					39	267*	167*	136-						
					263-			222-			74	164-	120	103	62	213*			24-		73	292*	177	152	36					
					316-		31-	239-			123-	168	121-	129-	90	264			45-		80	302	196	176*	43*					
					317*		69-	247		8-	186-	196-	133	130	116-	271	8	60			97-	322*	224-	178*	56*					
					348*	115-	128-	249-	40-	218-	228-	155	216	122*	332*	12	85-	25	104	327*	232*	211	88*						
					350-	157	172*	262-	65-	261-	230-	174*	257	154*	333*	79	86	41*	113	334	253*	225	91*			7*			
					386	162	184	270	84-	297	255	179	250	156*	342	105	143-	107	38-	340*	306*	265*	139			10*			
					392-	201-	226*	291*	124-	299-	272	183	305-	158	347-	118*	148	119	141*	344	313*	276*	149		4*	27*	8		
					397-	207-	274-	293-	245-	303-	277	227	321	185	359*	136*	180	160	173*	345-	337-	298*	163*		13	28*	35*		
					399-	261-	275-	296-	314	390-	279*	256	330	192	391*	166*	206*	170*	236*	346-	338*	356*	202*		19*	60*	49*		
					410-	287	310	349	329	446-	286	285	343	200-	422	171	243-	181*	240	378*	372	360*	241*	9*	25*	54*	77	78*		
					432-	294-	336-	393-	368-	456*	325	323*	351-	210-	429-	248	251	206	283*	421*	381	365-	252*	61-	92	99-	93*	87*		
					449	315	403-	409	388-	457-	328	384	356*	225-	430	254-	257	234*	295	437*	388*	404*	258	95	96*	127*	102*	106		
					453-	355-	406-	420-	414-	460*	352	401-	386*	231*	435*	278	269*	288	306	461*	537-	441	268*	161	125*	150*	144*	114*		
					455	382-	416-	436*	427-	481-	367	406	402	235	465	280	354-	289	361*	478*	546	536	324*	221*	163	818*	198*	146*		
					459*	413-	445-	469-	466	493	387	426-	411*	242	482-	301	398	311*	407*	494*	549*	541*	368*	278-	165	819*	209	147*		
					476-	505-	464-	471-	618	509	488-	467	449-	284-	504*	375-	412	338	540-	525-	665*	564*	438*	304*	162*	826*	282	214*		
513-					477-	532	474-	479-	629	517*	538*	489-	462*	376*	531	416	419*	380	558-	556*	575	569	481*	309*	199*	339*	290	217*		
519-					500-	560	483-	490*	630-	562-	544	501	473-	389	545-	423*	534-	405*	560*	566	591	572	491*	375	307	361*	320-	228*		
520-					503-	568-	502*	510-	668-	567-	574	516*	543	454	547-	452-	551-	448-	561-	613*	598-	579-	542*	379*	490*	470*	331-	300*		
527-					511-	601	507*	515-	671-	609-	606*	533*	596-	522-	597*	496-	563	460*	598*	620	603*	582*	563*	499	577*	557*	380*	312*		
611-		610		559-	607*	608	524	606	690-	615-	614-	535	604*	548-	602	523*	564	514*	600*	621	617*	584-	578*	508*	585*	578*	563	341*		
624-	512	629-		576-	618-	628	567-	627-	632	631-	626	622-	630-	570*	616	594-	626-	525-	612	623	619	589	599-	539*	586*	593	595*	556*	552*	

SEC. III. THE RELATIVE STANDING OF PUPILS BETWEEN GRAMMAR SCHOOLS AND HIGH SCHOOLS

These comparisons are made largely within each school separately, since it did not seem plausible to bring them together clearly in one general comparison. While the main purpose is to find out the correlation between the grammar school and high school through a comparison of pupils in single subjects, yet any facts that may corroborate or weaken points already brought out in previous sections relative to distribution of marks will also be discussed. Charts 38[2]–88 inclusive represent the distributions of the marks of pupils in the grammar school and high school.[1]

Some of the schools here involved did not use the percentage system of marking. In such cases, where the number of pupils is large, the actual distribution of marks is shown by accompanying graphs, and the columns as orginally charted are broken up into convenient forms for printing.

It was impossible to chart separately in tertile groups each of the ward schools of the various cities. Consequently a composite chart for the ward-school marks is used to represent the grammar school. For example, in the first comparison which follows, the high school is represented by 5, and the composite of the ward schools of this city is numbered 5′.

The eighth-grade work has been used as a basis of comparison to represent the grammar school. But in one city included in this section of the discussion there is no eighth grade. Pupils are sent on to high school, therefore, after successful completion of the seventh-grade work.

Some of the marks secured from the high-school records are averages of the two semesters; others are marks representing the final standing at the close of the year. The marks used in the eighth grade in case of school No. 5′ which follow are averages of the estimates made by teachers throughout the year and of the final examination given at the end of the year.[2]

a) Comparisons between grammar school No. 5′ and high school No. 5. —Sometimes the question has been raised as to whether the relation between the eighth-grade work and the high school varies to any considerable degree in case the comparison is made beyond the Freshman

[1] A repetition of 38 in numbering the charts made it necessary to number the above one 38[2].

[2] The grades of all the ward schools of this city are kept in a centrally located building. They cover a period of over ten years. They are preserved in large bound volumes, and would furnish a large amount of data for further investigation.

year in the high school. A comparison has here been made between the eighth-grade English and between each of the four years separately, together with a comparison between the eighth grade and the average of the four years' work in high-school English, in order to determine, if possible, whether any one year, or whether the average of four years, should better be used in trying to measure the efficiency of the relation between the two institutions.

The previous discussions have called attention to the variations in the distributions of marks within the same institution, and it may be noted that in charts 38^2–43 there are frequent variations in the curve of distribution.

The eighth-grade English in chart 38^2 tends toward a normal distribution with the mode about 90 per cent. Ignoring for a moment the characters which accompany the numbers in high-school charts 39–43, a considerable fluctuation of the groups may be observed. The first year of high school in chart 39 has a rather rectangular distribution, with the fewer number of marks toward the top of the scale and with several modes. The skew toward the lower end of the scale is even more marked in the Sophomore and Junior years. And in chart 42 there is apparently a somewhat capricious change in the grouping. An average of four years' work of English naturally smooths out the irregularities in the distribution, as may be seen in chart 43.

Is the low skew in chart 39 justifiable when compared with the same pupils in the eighth-grade English in chart 38^2? In view of the high-school English marks, as charted in the remaining years, one can scarcely avoid the conclusion that either this skewing toward the bottom of the scale is capriciously done, or that there is some lack of co-ordination within the high school itself. Further scientific evidence bearing upon the above conclusion could be obtained by making such comparisons between the sixth, seventh, and eighth grades as have been made between the seventh and eighth grades in sec. I of the previous discussion.

The distribution of the marks of 181 pupils in eighth-grade English, as shown in chart 44, is somewhat similar in its grouping of students to that of chart 38^2, from which group of 212 pupils these 181 are taken. A more rectangular equalization of marks over the scale occurs in the case of the Latin, chart 45. The retention shown in table V indicates a closer relation than was found to be the case between the eighth-grade English and the Freshman high-school English. A legitimate question to raise here is, To what extent may this closer correlation between Latin and English be due to the influence of formal grammar work in the eighth grade?

Charts 46 and 47, comparing eighth-grade history with Sophomore history, show a skewing of the curves of distribution in the opposite directions. This same tendency occurred in the previous charts, 38[2] and 39, comparing eighth-grade English with the Freshman year. But the total retention in case of history is several per cent higher than in the case of English, either for the Freshman or Sophomore years.

There is more similarity in the distribution of marks between charts 48 and 49 than there is between charts 48 and 50. It may be noted, however, that the higher end of the scale is used in the eighth-grade arithmetic, but not in the Freshman mathematics. Three-fourths of the marks of the pupils occur in the upper half of a range of twenty-six points in the scale used in arithmetic. What explanation or justification is to be offered for omitting wholly the five points at the upper end of the scale in the Freshman year, and for the rather equal distribution over the scale, with a weighting at the bottom in the Sophomore year, and in spite of the fact that these are the same pupils?[1]

Table V, showing a summary of the comparisons made between the grammar school and high school, indicates that the percentages of retention are lower between the two institutions than was found to be the case earlier within the same institutions.[2]

While standards and practices are no doubt more likely to differ between different institutions than in the same institution, yet when there is a low retention between primary and secondary school work is there not something to be done to remedy matters, either from one side or the other, and probably in most cases from both sides? In such large groups as we have here been considering would it be too much to

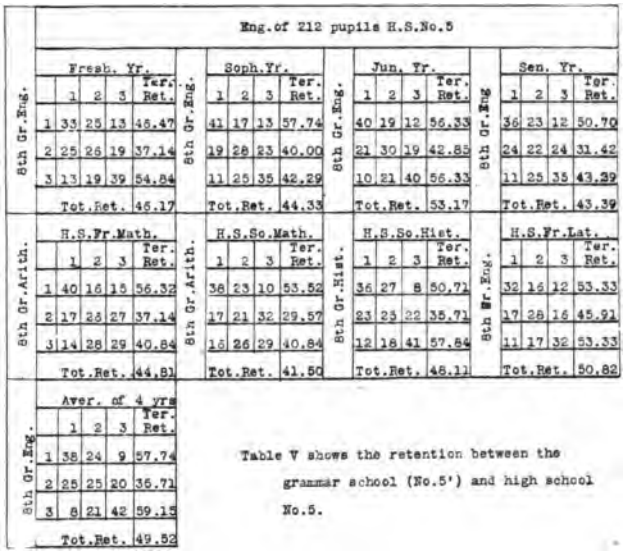
[1] Since there are 2½ years of mathematics required for entrance to college, students of course cannot drop it at the end of the first year if they are expecting to go on to college.

[2] While the comparisons made in English show some variations in retention, yet a tentative conclusion is justifiable. Either the retention for the Freshman year or for the four years' average would give a fair indication of the relation between the two institutions on the basis of a single subject.

One advantage in using the Freshman year, providing the two institutions are working in co-operation, would of course be that there is not likely to be so much difference between the eighth-grade English and the Freshman English as there is between the eighth-grade and some of the later years of high-school English, and hence in some sense this would result in a fairer statement of the correlation. Furthermore, real articulation of the grammar school and high school depends more upon the first year of high school than on any other, and so the matter needs to be thought of in terms of expediency. An advantage in using the four years' average is that it includes all the variable factors entering into the three or four years of English taken.

expect that the retention between the eighth-grade work in a single subject should be about as high as that between representative years within the same institution?

When table V is compared with the previous table, that summarizes the retentions within the institutions themselves, it will be found on the whole that the results are lower between different institutions than within the institutions. According to the tertile method, the retention is below 50 per cent except in the comparison between eighth-grade English



Eng. of 212 pupils H.S.No.5

8th Gr. Eng.

	Fresh. Yr. 1	2	3	Ter. Ret.
1	33	25	13	46.47
2	25	26	19	37.14
3	13	19	39	54.84
	Tot. Ret.			46.17

8th Gr. Eng.

	Soph. Yr. 1	2	3	Ter. Ret.
	41	17	13	57.74
	19	28	23	40.00
	11	25	35	42.29
	Tot. Ret.			44.33

8th Gr. Eng.

	Jun. Yr. 1	2	3	Ter. Ret.
	40	19	12	56.33
	21	30	19	42.85
	10	21	40	56.33
	Tot. Ret.			53.17

8th Gr. Eng.

	Sen. Yr. 1	2	3	Ter. Ret.
	36	23	12	50.70
	24	22	24	31.42
	11	25	38	43.39
	Tot. Ret.			43.39

8th Gr. Arith.

	H.S. Fr. Math. 1	2	3	Ter. Ret.
1	40	16	15	56.32
2	17	28	27	37.14
3	14	28	29	40.84
	Tot. Ret.			44.81

8th Gr. Arith.

	H.S. So. Math. 1	2	3	Ter. Ret.
	38	23	10	53.52
	17	21	32	29.57
	16	26	29	40.84
	Tot. Ret.			41.50

8th Gr. Hist.

	H.S. So. Hist. 1	2	3	Ter. Ret.
	36	27	8	50.71
	23	23	22	35.71
	12	18	41	57.84
	Tot. Ret.			48.11

8th Gr. Eng.

	H.S. Fr. Lat. 1	2	3	Ter. Ret.
	32	16	12	53.33
	17	28	16	45.91
	11	17	32	53.33
	Tot. Ret.			50.82

8th Gr. Eng.

	Aver. of 4 yrs 1	2	3	Ter. Ret.
1	38	24	9	57.74
2	25	25	20	36.71
3	8	21	42	59.15
	Tot. Ret.			49.52

Table V shows the retention between the grammar school (No.5') and high school No.5.

and Junior English and the comparison between eighth-grade English and Freshman Latin for high school No. 5 and grammar school No. 5′.

When these same comparisons are performed according to the modified median method the general result is that there is a retention of about 70 per cent between grammar school No. 5′ and high school No. 5. The exact percentages of retention appear in the footnote below.[1]

[1] For eighth-grade and Freshman English, 66.18; for eighth-grade and Sophomore English, 64.78; for eighth-grade and Junior English, 71.83; for eighth-grade and Senior English, 67.60; for eighth-grade and the four years' average, 76.05 per cent; for eighth-grade and Freshman mathematics, 61.96; for eighth-grade and Sophomore mathematics, 68.30; for eighth-grade and Sophomore history, 73.93, and for eighth-grade English and Freshman Latin, 71.66 per cent. It will be observed that the percentages of retention according to this method change a little relatively among the different years and subject themselves from that shown in table V. This is to be accounted for by the fact that in the tertile divisions the middle third is such a variable factor.

b) Comparison between grammar school No. 8′ and high school No. 8 in English only.—Charts 51 and 52 represent the distributions of the marks in eighth-grade English and an average of the three years of work done in the high school.[1] In chart 51 the marks of the eighth-grade pupils are numerous toward the higher end of the scale. This was found to be characteristic not only of grammar school No. 8′, but in the majority of the grammar schools studied it was found to be a general tendency to load the scale of grading toward the top. Such tendencies as these have already been observed in charts 38[2], 46, 48. It may also be noted in the advance charts 55, 57, 83, 85, and in such graphs as accompany charts 60, 62, 64.

Several reasons were offered for this by various principals and superintendents. Some said it was because there was more inclination to lump off grades in the grammar school than in the high school; others, that it was partly due to the fact that parents influenced either directly or indirectly the estimates made by teachers; others, that it is not possible to make fine discriminations in the ratings of pupils in the grammar-school work; others, that it was an attempt on the part of teachers so to encourage pupils that they would continue their work and go on to high school. Whatever the explanation may be of this tendency to skew toward the top of the scale, the tendency obviously exists. An exception to this occurs in chart 53.[2]

The result of the comparison in grammar school No. 8′ and high school No. 8, as indicated in table VI later on, shows that the total retention between the eighth-grade English and the three years' average of the high-school English is about the same as that for the eighth-grade English and Freshman year in schools Nos. 5′ and 5, but it is lower than the total retention for the eighth grade, and the average of the four years' English in schools Nos. 5′ and 5, respectively. In terms of the modified median method the retention is 71.43 per cent.

c) Comparison between grammar school No. 10′ and high school No. 10 in English only.—High school No. 10 is of the older type of the county high schools of Kansas to which country-school pupils are admitted upon the satisfactory completion of the eighth-grade work. Some of

[1] In high school No. 8 the eighth-grade marks here used were recorded in the same book on the same pages with the marks made by pupils in the high school. Such an arrangement would make it an easy matter to send to the college or university a statement of the pupil's previous school career.

[2] Some of the marks used in chart 53 represent standings in the city school; some of the marks are those received by pupils from the country, who upon entering the high school are given an entrance examination by a board of examiners.

the pupils in this high school consequently have come directly from the country; some of them have completed their eighth-grade work in the city schools; many of the parents of these latter children have moved from the farm to the city.

This much is said because while the high school of this city and the grammar schools are carried on somewhat separately, yet in reality the previous conditions of both the high-school pupils and grammar-school pupils have been very similar.

		H.S.No.8 Charts 51, 52			
		Aver.3 yrs.Eng.			
8th Grade Eng.		1	2	3	Ter. Ret.
	1	22	10	10	52.38
	2	14	16	12	38.09
	3	6	16	20	48.61
		Tot.Ret.			48.03

		H.S.No.10 Charts 53,54			
		Aver.3 yrs.Eng.			
8th Grade Eng.		1	2	3	Ter. Ret.
	1	30	15	15	60.00
	2	11	18	21	36.00
	3	9	17	24	48.00
		Tot.Ret.			48.00

		H.S.No.7 Charts 55,56			
		Fresh. Math.			
8th Grade Arith.		1	2	3	Ter. Ret.
	1	48	27	15	53.33
	2	30	34	26	37.77
	3	12	29	49	54.44
		Tot.Ret.			48.51

		H.S.No.7 Charts 57,58			
		Fresh. Eng.			
8th Grade Eng.		1	2	3	Ter. Ret.
	1	46	28	16	51.11
	2	30	29	16	32.22
	3	14	33	43	47.77
		Tot.Ret.			43.70

		H.S.No.7 Charts 57,59			
		Soph. Eng.			
8th Grade Eng.		1	2	3	Ter. Ret.
	1	50	22	18	55.55
	2	26	33	31	36.66
	3	14	35	41	45.55
		Tot.Ret.			45.74

		H.S.No.6 Charts 60,61			
		Aver.of Fresh. & Soph.Math.			
8th Grade Arith.		1	2	3	Ter. Ret.
	1	55	36	22	47.78
	2	42	40	30	35.71
	3	16	36	61	53.98
		Tot.Ret.			46.15

		H.S.No.6 Charts 62,63			
		Aver.of Fresh. & Soph. Lat.			
8th Grade Eng.		1	2	3	Ter. Ret.
	1	65	32	4	64.35
	2	27	36	37	36.00
	3	9	32	60	59.40
		Tot.Ret.			53.31

		H.S.No.6 Charts 64,65			
		Aver. of Fresh. & Soph. Eng.			
8th Grade Eng.		1	2	3	Ter. Ret.
	1	75	29	9	66.37
	2	25	49	38	43.75
	3	13	34	66	58.40
		Tot.Ret.			56.21

TABLE VI

Shows the retention between eighth-grade and high-school work in schools Nos. 8, 10, 7, and 6.

In the high school the range of the scale of marking is from 80–100 per cent. And as noted before, when an average of three or four years is taken the curve of distribution is likely to be more normal than when any one year is considered separately.

The percentage of retention is somewhat higher than in school No. 8, where the average for three years is used. But as is shown in table VI, school No. 10 is nearer the retention in school No. 5, where the average of the four years is used. According to the tertile method the retention between school No. 10′ and school No. 10 is a little below 50 per cent when the single subject of English is considered; according to the modified median method it is 73 per cent.

d) *Comparison between grammar school No. 7′ and high school No. 7 in English and arithmetic.*—Where different systems of markings are used it is somewhat difficult to make absolutely accurate comparisons, either between different subjects within the same institution or between the same subjects in different institutions. In grammar school No. 7′

the percentage system is used; in high school No. 7, numbers 1, 2, 3, 4. In the high school, numbers 1, 2, 3 represent the passing-marks, respectively, from high to low standing; number 4 indicates failure.

As previously pointed out, when only a three-estimate system of rating pupils is used it is convenient to represent the distribution by graphs accompanying the charts whose columns are broken up into convenient forms for printing. When the graphs are large they have been reduced in size.

If in the case of the high-school marks we let 1, 2, 3 represent respectively 95, 85, 75 per cent, it is more easy to find an average of the two semesters' work done in any one year.[1]

In case a pupil receives a mark of 1 for the first semester and 2 for the second semester, by the above translation his standing would be 90 per cent. It is difficult for an investigator to find an average of the pupil's standing by means of merely the marks 1 and 2, for example, and so the high-school marks of school No. 7 have all been reduced to percentages based upon semester marks.[2]

The range of marking used in charts 55 and 57 is unusually wide, and as pointed out in a previous chart, 48, there is a great non-use of the points toward the lower end of the scale. The number of marks occurring below 75 do not evidently represent as distinct steps or gradations as those of the next fifteen points above 75 per cent.

From the graphs which accompany the charts it is easy to see at a glance the tendency, in the distribution of marks, to skew toward the top of the scale. This appears in a large number of the high schools, as may be seen in charts 56, 58, 59, representing school No. 7, and in such later charts as 89, 101, 103, 105, and in the charts representing the 23 different high schools which are compared with the college. This, of course, is not necessarily a criticism. Some exceptions to this upward tendency will appear farther along.

[1] This is not so accurate a method as where the percentages are given all along in a wider scale. Since 1 really stands for a range of grade about 95, 2 for a range of about 85, and 3 for a range of about 75, there may be some objections raised against the above translations. But if all of the three-estimate systems are treated in the same way the facts will not be distorted.

[2] The records in the high school are temporarily preserved on cards, and permanently in bound volumes, but it was very difficult to secure records for the elementary schools covering any number of years. Since only high-school graduates were considered, it was necessary to begin as far back as 1907 for the first elementary records. Many of the records before this were not available. It was only through the assistance of trained helpers and persistent ward-school and high-school principals that the records which had not been destroyed were secured.

The percentage of retention for schools Nos. 7′ and 7, as shown in table VI, for English is lower than in the other schools so far compared, but this may be partly due to the fact that such a different scale of marks is used in the two institutions. However, the retention for mathematics is higher than was the case in school No. 5. The result stated in terms of the modified median method is a retention of about 70 per cent.[1]

d) Comparison between grammar school No. 6′ and high school No. 6 in arithmetic, Latin, and English.—A few general explanations will be of assistance in making clear the comparisons in schools Nos. 6′ and 6. The marks used are in terms of *e, g, f; e* stands for excellent, *g* for good, and *f* for fair. The records for many years showed that exponents had been used with the letters in order to make finer discriminations. For example, in a scale from 70–100, f^1 f^2 or g^3 g^5 or e^6 e^7, indicated 71, 72, 83, 85, 96, and 97, respectively.[2]

Since there were so many available records of the later years which did not include exponents, these were dropped from the letters in the earlier marks. But the exponents made it possible to number the pupils in the eighth-grade English in chart 64 approximately in order of their standing. Consequently, number 1 begins by representing one of the pupils among the very best, and 338, the final number of the list, represents one of the pupils among the poorest in the whole group. This means in such a chart as 64 that individual 102 has a higher standing than has 110 or 114; or that 218 has a higher standing than 223 or 229, for example. The pupils in chart 60 are represented by these same numbers.

The letters *e, g, f* are used also in the high-school markings.[3] These are reduced to percentages, as was done previously in the case of numbers. If we let $e=95$, $g=85$, and $f=75$, then when a pupil has a standing of *e* during one year and a standing of *g* during another, the average for these two years' work is *eg*, or 90 per cent; in like manner *ef* is 85 and *fg* is 80 per cent. The base lines are broken simply for the purpose of assisting the reader at a glance in seeing the relative number of pupils who have received the various standings.

[1] The exact retention according to method No. 2 is 67.21 for eighth-grade English and Freshman English; 69.94 for eighth-grade English and Sophomore English; and 69.99 for eighth-grade arithmetic and Freshman mathematics.

[2] The records for the ward schools of this city were the most elaborate of any school investigated. The marks of the elementary-school pupils have been preserved for ten or fifteen years in large bound volumes, and are kept on file in the superintendent's office.

[3] The high-school records are kept on cards filed in boxes alphabetically arranged.

The distribution of marks in the elementary school, as indicated by the graphs, re-emphasizes the previously mentioned tendency to skew toward the upper end of the scale. However, graph 60 shows a somewhat more normal distribution than 62 or 64. Chart 63 shows a peculiar equalization of marks over the scale with about as many excellent and poor as there are mediocre pupils. This rectangular distribution provokes the question as to whether in a group of over 300 pupils capacities are really so equally divided as this chart would indicate.

Graph 60 shows that the absolute marks of the pupils as a group are higher than was the case in high school No. 5, where the groups were shifted toward the lower end of the scale. But when the graphs representing 60 and 61 are compared with each other there is considerable similarity, which probably indicates that the two institutions are using approximately comparable systems of marking, at any rate in this particular subject.

The general result of the comparison in grammar school No. 6′ and high school No. 6, as shown in table VI, indicates that the retention in mathematics is below 50 per cent, as has been the case in schools Nos. 5 and 7. The retention in English in school No. 6 is higher than in any of the previous schools, which is a probable indication of the closer correlation between the eighth grade and high school in this single subject. The retention between English and Latin is higher than the retention in schools Nos. 5′ and 5 in this same subject. The result of the comparisons in schools Nos. 6′ and 6 upon the basis of the modified median method is a retention of over 75 per cent.[1]

The result of the comparison of these different grammar schools and high schools of Kansas is that there is a retention of about 70 per cent; that for schools Nos. 5′ and 5 being about 70 per cent; that for schools Nos. 8′ and 8 in English only, 71+ per cent; that for schools Nos. 10′ and 10 in English only, 73 per cent; that for schools Nos. 7′ and 7 about 70 per cent, and that for schools Nos. 6′ and 6 above 75 per cent.[2]

[1] The actual retention for eighth-grade arithmetic and Freshman-Sophomore arithmetic is 69.02 per cent; for eighth-grade English and Freshman-Sophomore English is 77.87, and for eighth-grade English and Freshman-Sophomore Latin, 74.75 per cent. The higher retention between grammar school No. 6 and high school No. 6 may be partly due to the fact that the same system of marking within a narrow range or scale is used, but it is also no doubt due to a somewhat closer correlation of institutions on the basis of single subjects compared.

[2] This result will be supplemented in sec. V. One additional grammar-school and high-school comparison will there be included. Sec. V will deal only with the pupils who went on to college.

e) Comparison between grammar schools Nos. 2′, 3′, 4′, and high schools Nos. 2, 3, 4 in mathematics, English, and Latin (not in Kansas). —Since the practice in both elementary schools and high schools is somewhat different from the previous schools compared in this section, a few explanatory statements are appropriate here. The elementary schools of this city do not have any eighth grade. Pupils who satisfactorily complete the seventh grade are promoted to the high school.[1]

Since it was necessary to go back at least four years for the first grammar-school records of the high-school graduates, it was not easy to recover the marks of pupils who had completed the grammar school even eight or ten years ago. There was great difficulty in securing the grammar-school marks, partly because of the size of the city, partly because many records were either scattered among *individual teachers* and pupils, or were destroyed.

The percentage system of marking is used in the various ward schools, but the letter sytem is used in the high schools, namely, *e* for excellent, *g* for good, *m* for medium, and *p* for poor. Those receiving the grade of poor are graduated from high school, but are not recommended for college. For purposes of comparison the letters were reduced to percentages by using *e* to represent 95 per cent; *g*, 85 per cent; *m*, 75 per cent, and *p*, 65 per cent.

The high-school marks were in the first place charted separately and compared with the marks of the grammar-school pupils who came to the high schools, respectively.[2] Composite charts were afterward made for the grammar schools and high schools. Grammar school No. 2′, for example, represents the total group of students coming from the different ward schools to high school No. 2.

In the majority of instances charts 66, 68, 70, 73, 75, 77, 80, representing the grammar schools, together with the composite charts 83, 85, and 87, show a tendency to a normal distribution of marks. In a few grammar schools the standings of pupils were recorded in terms of *a, b, c.* Where this was found to be the case, these letters were respectively transferrred to 95, 85, 75 per cent. This does not vitiate the

[1] The seventh-grade records of pupils are placed upon the diplomas received and from these the high-school principal gets some idea of the previous career of the pupil. If these could be permanently preserved, together with the high-school record of the four years' work, they would furnish good data for a comparison with the same pupil's career in case he goes on to college.

[2] It was possible to determine from the records kept in high school No. 3 in precisely what order a pupil had pursued a certain branch. If, for example, a pupil had pursued a first-year subject during his Senior year, it was so recorded.

results of plotting the curve, because these same marks, if they had originally been in terms of percentage, would have been grouped around these percentages. This fact explains the frequency of marks over the multiples of five. Together with this explanation it may be added that there is obviously frequent use of the multiples of five.

Charts 83 and 87 are composed of the same pupils. The distributions of the marks in the seventh-grade arithmetic and the seventh-grade English are much alike. This is an indication that somewhat similar standards have been used in the two subjects.

The mode in chart 67, representing the distribution of the marks in Freshman-Sophomore mathematics in high school No. 2, occurs over 85 per cent, while in chart 74, representing the marks in high school No. 3, it occurs over 75 per cent. Both tend toward a normal distribution. Although the curves of distribution are somewhat more normal than in some of the high schools already charted, yet in 67 there is an upward skew, in 74 a downward skew.

Composite chart 84 includes an additional list of students who were not included in the original chartings of schools Nos. 2, 3, and 4 separately.[1] The accompanying graph shows a distribution more normal than in the majority of the high schools studied, but there is a slight downward skew.

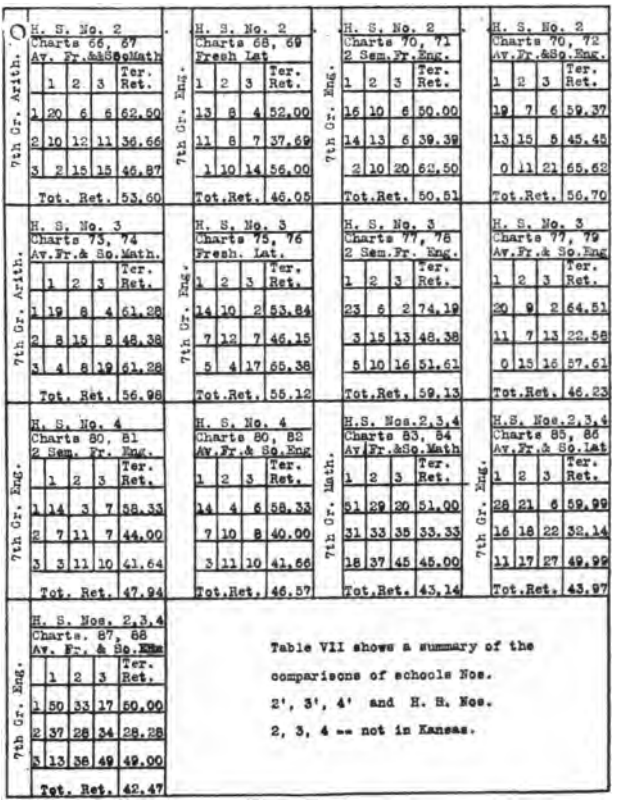
Chart 69, representing Latin, skews toward the top more than the distribution in chart 76, representing school No. 3. The composite chart 86 also includes some additional marks of pupils. It tends toward a normal curve, with the group shifted a little toward the top of the scale.

In high school No. 4 numerous marks appear toward the bottom of the scale in chart 81 which does not appear justifiable, either when compared with chart 80 in seventh-grade English or with chart 82, representing the work of the same people during the Freshman and Sophomore years.[2] Again, this distribution in chart 81 may be compared

[1] The arrangement of marks in chart 81 furnishes ground for the statement that school 4 tends to give many low marks during the first year's work, as is evidenced by the fact that 22 pupils out of 73 receive a standing of 65 per cent, or the rating as poor. Most pupils who remain in school after the first yeai get above this standing, at least a little, and so in chart 82 some who had an average of *pm* for the two years' work appear over the grade of 80, and the others have improved beyond this orignal standing.

[2] In a few of the composite charts additional pupils have been included. This is due to the fact that some of the data could not be gotten until after some of the separate charts had already been completed.

with charts 78 and 79 of school No. 3, where there is apparently greater consistency, within the high-school marking at any rate, or with charts 71 and 72, representing school No. 2, or finally, with the composite of 299 pupils in chart 88, where there is a more normal distribution.



The percentages recorded in table VII are summaries of the comparisons made between grammar schools Nos. 2′, 3′, 4′ and high schools Nos. 2, 3, 4 in mathematics, English, and Latin. According to the tertile method high school No. 3 stands highest. This may be partly due to the fact that in one of the other high schools there has been a considerable shifting of students because of a new building in construction, and also because, in the redistricting of pupils, a rather large proportion of weaker pupils came in. And again, in the remaining high

school, probably the old-line subjects do not get the same emphasis as in high school No. 3.

The total retention when these schools are charted separately compares favorably with the summary tables representing the schools of Kansas, yet the composite charts for schools Nos. 2, 3, 4 show a rather low retention. This is no doubt in part due to the fact that the majority of the added pupils were taken from school No. 4, where the retention is lower than in the other two high schools, which were charted separately. The correlation, as before pointed out, is lowest in schools Nos. 4′ and 4, so that the addition of students in the composite charts from school No. 4 no doubt lowers the total retention.

The total retention between the seventh-grade English and the Freshman-Sophomore Latin in the composite chart is higher than either that between seventh-grade English and Freshman-Sophomore English or than that between seventh-grade arithmetic and Freshman-Sophomore mathematics, and the retention for the mathematics is the lowest. It is interesting to note that in the majority of the comparisons made in grammar schools and high schools the correlation between English and Latin has been higher than the correlation between grammar-school English and high-school English.

While the retention in terms of the modified median method for the composite charts is a little below 70 per cent, yet when the chartings of the high schools are regarded separately, the general result is about the same as in the schools of Kansas, namely, 70 per cent.[1]

[1] The actual retention for the composite charts in mathematics is 65.5 per cent; for Latin, 68.27, and for English, 66. For the separate high-school comparisons it would be above this, as may be seen by comparing the tertile retention for the composite with the separate chartings in table VII.

Chart No. 38. Eighth grade English of 212 pupils.

71 pupils												70 pupils				71 pupils										
															11											
															20											
															54											
															59											
															63											
															67											
															82											
													2		99											
													10		110											
												19	17		114											
												48	28		129											
											7	62	32		132				9							
											22	79	42		133				12							
											47	80	53		136		3	5	27							
											55	84	76		154	1	30	43	71							
											56	102	91	37	164	16	40	57	74							
										29		60	109	92	50	169	23	46	78	86						
										70		95	113	97	105	171	39	73	116	89						
							6	31	13	83	25	98	127	115	106	174	49	85	138	96						
24							33	38	68	112	26	111	137	117	107	178	72	122	144	155						
45							51	118	69	123	44	119	149	162	124	186	88	134	163	160	145	14	15	4		
52		64		21			61	125	131	142	75	148	150	166	146	189	108	140	170	176	172	18	34	36		
68		100	128	35	94		90	126	132	167	135	159	151	168	165	202	121	187	177	184	190	130	41	65		
77	8	104	188	93	101	120	153	152	180	179	183	157	175	198	203	173	208	192	195	204	141	156	66		
201	87	161	191	103	161	199	158	185	212	211	193	197	182	200	210	194	209	205	196	207	143	206	82	147	
75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

Chart No. 39. Fresh. English of 212 pupils.

54%							37%							46%											
									5*						1*										
									6-						21-										
									16*						36*										
									17						50										
28		7							19	23*					68-										
31-		38-							76	44-				33-	74*										
53		61-							78*	67			18*	41*	79										
58-		69-		9*		26-	54		39*	124	106		20	51-	86*										
62		75-	8-	10	43*	47-	55-		64-	139-	122*		22	99	92										
63		87-	29-	30*	46*	48	89*	16*	80	153-	145*	2	24-	102	97		3*								
73*		142-	35-	71*	49*	52-	95-	56-	81	163-	148-	45-	40*	107	106		4*								
83-		166	137	72*	77-	70-	96*	114	88*	164	169	100-	42	108*	116*	54*	98-	12*							
136	11*	180-	146	93-	115	90-	112-	154	101-	172*	194*	104-	99-	110	118-	37	141*	32							
149	13-	186	152-	127	128-	91	113	158-	109	175	191-	140*	59-	120-	132	117	143*	60-							
161-	25-	193-	183-	131-	134*	103-	119-	170*	144*	177*	200	150	85*	126-	138*	121*	151	123-	57*	66*					
181-	84	202	188-	179-	135-	155*	167-	192*	162	197	207	198	111-	129	195*	125-	168	147*	65*	133					
185-	165	211-	201-	208*	213-	159-	190*	199-	205*	189	210	204*	157	175*	203	130*	182	156*	82*	178		14*			
													160*	206*	209*	171	187*	173*	174	184*		196*			
75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

Chart No. 42. Sen. English of 212 pupils.

										9*															
		42%						31%		31-								50%							
										35-															
										43*															
										48															
					1*					75-															
					27*					86*	45-		4*												
			24-		29-					121*	73*		10												
			47-		54		37			126-	58-		19												
			52-		64-		39*			131-	50		42												
			55-		68-		62			135-	80		60-												
			59		95-		77-	30*		138*	83-		96*												
7		44-	67	6-	100-		90-	85*		140*	117		125-		11*		17								
22		46*	87-	8-	102		114	92		142-	122*		130*		16*		18*								
28		61-	101-	25-	103-	23*	123-	93-		145*	139-		141*		32		36*								
70-		63	105	26-	107	51-	137	97		148-	163*		151	2	56-		65*								
72*	13-	71*	106	38-	112-	109	155*	98-		175	168	34*	157	74*	57*		79		5*						
104-	41*	84	127	49*	115	144*	176*	113		194*	170*	69-	162	116*	66*		132		15*						
120-	111-	91	152-	53	124	159-	181-	118-	129	199-	183-	99	173*	149	78*	21-	143*	89*	40*	12*					
128-	153-	134*	167-	110	146	193-	190*	158-	171	202	195*	108*	187*	150	119-	33-	147*	94-	82*	14*					
166	161-	172*	179-	136	154	205*	197	189	182	204*	200	164	188-	156*	133	88*	174	184*	169	20	3*				
185-	203	212-	180-	186	177*	208*	201-	211-	192*	206*	210	191-	198	178	165	160*	209*	196*	207*	76	81				
75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

Chart No. 43. Average of 4 years of English, 212 pupils

							9*																		
		59%					10	1*	35%									57%							
							48	30*																	
					6-	24-	64-	39*																	
					25-	29-	67	43*																	
					27*	35-	69-	44-																	
					31-	41*	73*	45-		23*															
					47-	68-	95-	102		59	37														
					49*	75-	100-	103-		81	88*														
			7		52-	77-	105	106		85*	92														
			13-		54	90-	111-	119-		107	96*	2													
			38-	8-	58-	101-	113	126-	11*	110	97	16*	17		33-	6*									
			53	22	104-	112-	114	131-	26-	118-	108*	19	34*	4*	40*	15*									
		70-	55-	46*	109	115	137	140*	51-	123-	117	50	42	56-	57*	18*									
		71*	61-	63	135-	120-	149	155*	80	129	151	78*	60-	76	143*	21-									
		72*	62	84	146	124	159-	158-	122*	139-	162	98-	74*	86*	156*	32	20								
		161-	83-	91	153-	142-	172*	163-	145*	150	164	138*	89*	116*	168	94-	36*								
		166	93-	134*	154	144*	175	190*	148-	163*	165	171	99	130*	173*	132	66*								
	28	181-	127	136	186	167-	177*	192*	179-	176*	170*	191-	121*	157	178	141*	79			14*					
	87-	185-	152-	201-	208*	197	188-	194*	189	200	182	198	125-	160*	207*	169	133	65*	3*	82*					
	128-	193-	180-	212-	211-	199-	202	205*	203	206*	195*	210	204*	187*	209*	174	184*	147*	12*	196*					
75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

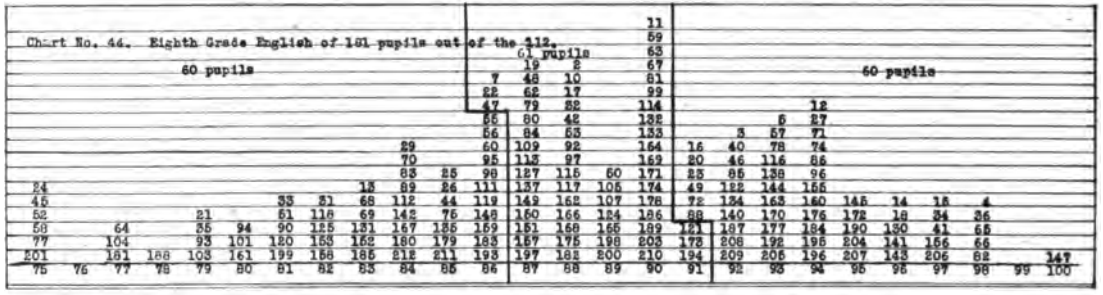


Chart No. 44. Eighth Grade English of 161 pupils out of the 112.
60 pupils
61 pupils
60 pupils

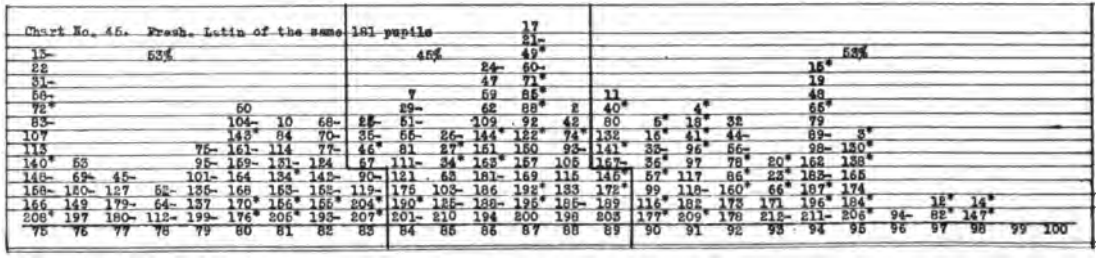


Chart No. 45. Fresh. Latin of the same 161 pupils
15%
45%
53%

Chart No. 46. Eighth Grade History of the same 212 pupils as in English.

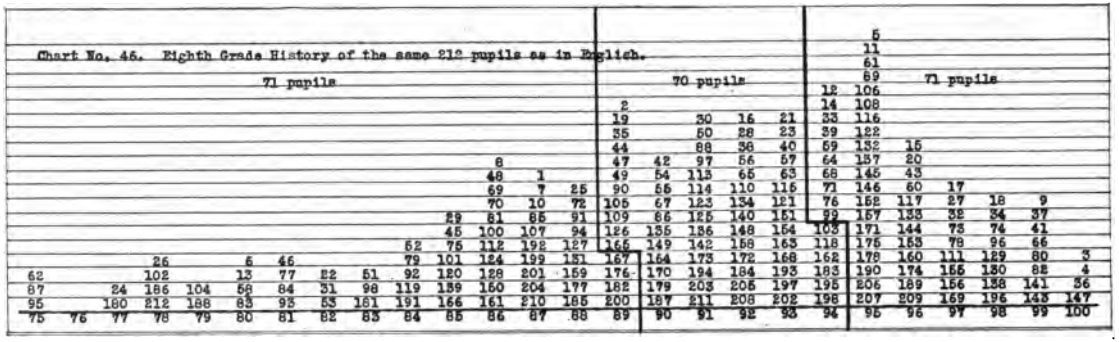


Chart No. 47. Soph. History of 212 pupils.

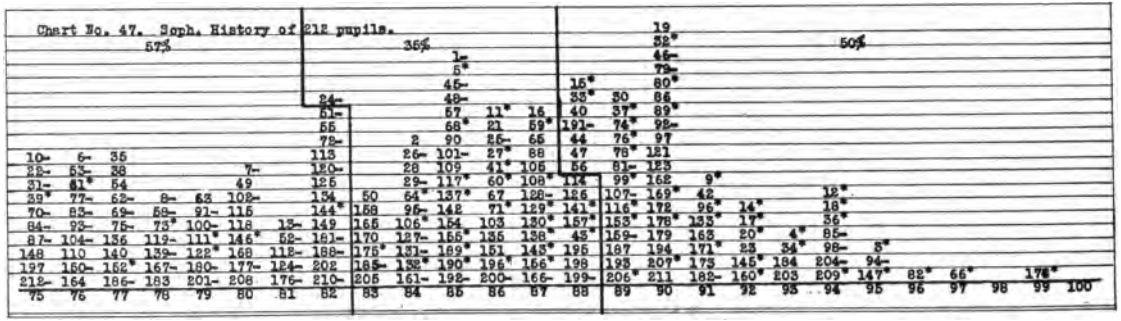


Chart No. 48. Eighth Grade Arith. of the same 212 pupils.

																		4							
																		5				7			
							71 pupils					20			70 pupils		67	19	14		18		71 pupils		
												48	12				74	41	21		30				
												73	17		2		90	50	40	43	44				
												76	23	54	11	9	106	67	63	82	55	37			
												78	31	56	27	46	108	71	60	92	96	65			
										10		110	49	69	28	112	120	81	91	99	97	66			
										29		118	61	79	32	113	122	101	116	107	106	89			
										38	15	123	70	85	39	119	124	132	127	138	114	121			
							1		51		47	22	126	72	95	42	128	140	141	129	144	117	143		
							8		77		64	59	146	88	111	53	133	157	153	148	154	130	145		
					33		26		87	6	151	109	150	104	115	86	137	160	158	170	155	163	165		
					60		52		103	13	158	139	159	125	134	98	162	161	171	174	156	172	176		
45		25			62		58		142	16	166	192	175	131	149	135	167	164	182	178	179	177	184		3
75	83	84			68		102		183	24	173	199	188	203	181	152	169	190	194	187	193	195	196	54	86
201	186	95	191	35	100		211	136	210	198	185	207	212	208	205	180	189	200	209	202	197	204	206	94	147
75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

Chart No. 49. Fresh. Math. of the same 212 pupils.

												1-													
												5													
					40%							8-	37%								56%				
												17													
												46					15-	9							
												57					21*	18*							
												60-					34*	23							
											7*	74					36*	26-							
											22-	65					45-	33-							
											24-	102-			20-		56	39							
											25-	107*		16-	63*		78-	48-							
											49	112		44*	32		80*	86	4						
										10-	51-	116*		50*	59-	30*	96*	94*	41*						
										19*	68-	150-		73-	29-	37*	97*	98	43*						
							3*	42		35-	70	151-	2	61*	64-	40*	141*	117*	65*						
							11	64-	28	47-	76-	154*	27	92	111	79	144*	148*	71*						
				72	55*		53	108	67*	88	91*	162	38-	115	145*	82*	163*	165*	106*	12					
				77-	69	31	75-	139-	114*	100-	120	171	58-	131-	153*	99*	174*	176*	134	14*					
			13-	90	83-	62-	104	140	159-	105	123-	172*	122	136-	160	156*	183-	177*	138*	66*					
			54	103-	118-	87-	109-	158-	161	113	137	190	152	165*	167	169	188-	178*	157	130*					
6-			56-	124	126-	119	110-	168	164	129*	143*	193*	166-	175-	199-	173-	189	187*	182	132*					
61	95-	93	101*	125	128	121*	181	185-	170*	135	142-	195*	194	180	200	192-	197*	191-	204*	133					
89*	146-	127*	202*	149	211-	201-	218-	210-	196*	179*	147*	208-	207-	186-	209	206	198-	203-	206*	184*					
75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

10- Chart No. 50. Soph. Math. of same 212 pupils.
15-
42 40% 29% 8%
49
54
55*
61
62-
64-
66- 31
69 57 35-
77- 60- 39-
85 84- 95
103- 84- 6- 104 87-
111 29* 89 112* 157
121 67* 97* 114* 118*
126 76 63 142* 146*
128 146- 139- 135 145*
129 148 140 156* 158-
131 169- 166- 176- 110- 166- 151-
133 169- 175- 160- 179* 164 194
135 180 180- 201- 161 194 168
175 76 77 78 79 80 81
82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

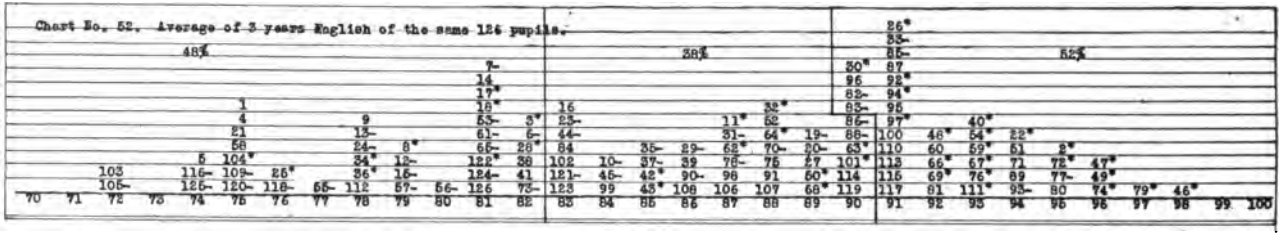


Chart No. 52. Average of 3 years English of the same 126 pupils.
48%
38%
82%
70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

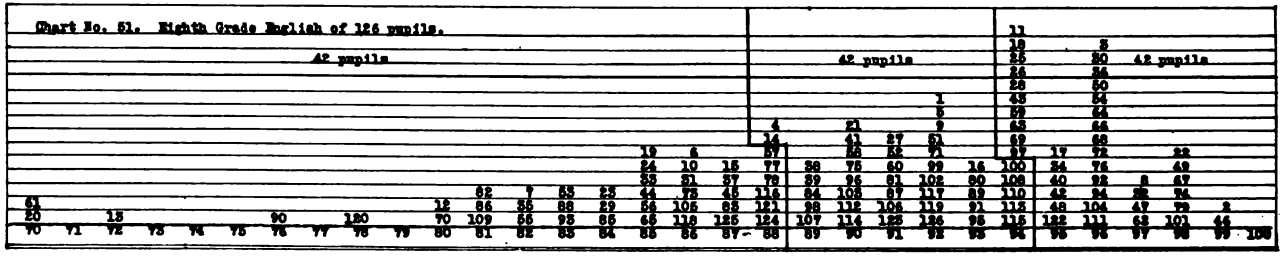


Chart No. 51. Eighth Grade English of 126 pupils.
42 pupils
42 pupils
42 pupils
70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

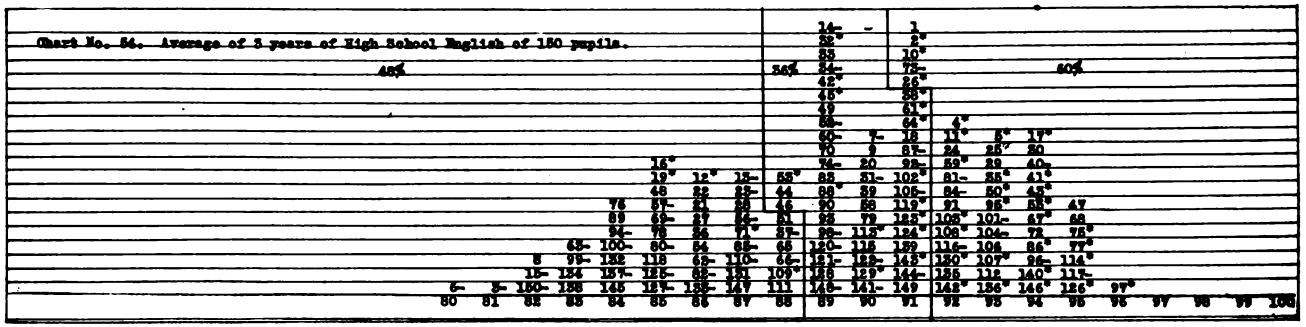


Chart No. 54. Average of 3 years of High School English of 150 pupils.
40%
56%
40%
80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

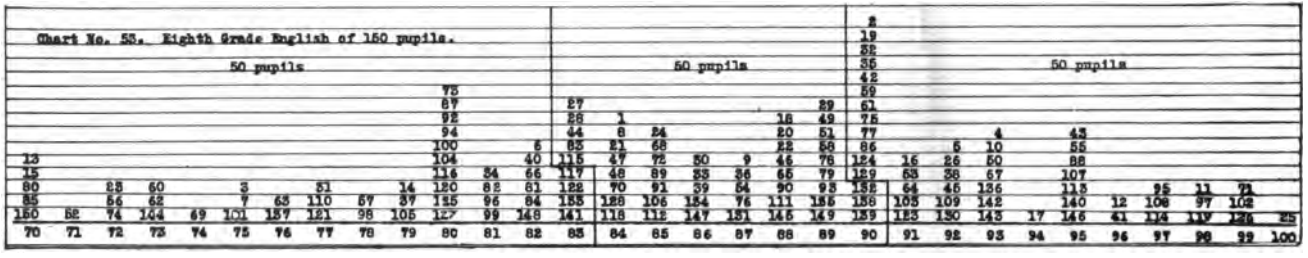


Chart No. 53. Eighth Grade English of 150 pupils.
50 pupils
50 pupils
50 pupils
70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

Chart No. 55. Eighth Grade Arith. of 270 pupils.

90 pupils | 90 pupils | 90 pupils

Mark	Pupils (top to bottom of column)
60	93, 119, 167, 217, 228, 229
61	99
62	27, 92
63	
64	87, 126
65	115, 147
66	128
67	191
68	146, 151
69	
70	89, 166, 200, 223
71	48
72	107, 202, 207
73	44
74	149, 253
75	51, 67, 129, 152, 156, 164, 226, 240
76	23, 69, 109, 216, 232, 237
77	62, 104, 118, 127, 220
78	70, 76, 124, 139, 243, 246, 250, 254
79	12, 45, 98, 112, 252, 264
80	91, 105, 133, 155, 160, 169, 171, 174, 176, 219, 263
81	8, 58, 90, 132, 193, 238, 258, 266
82	26, 47, 86, 253
83	59, 74, 244
84	9, 53, 56, 61, 77, 81, 83, 190, 225, 241, 245, 249
85	35, 68, 82, 84, 100, 130, 142, 172, 187, 188, 196, 218, 256, 269
86	7, 19, 57, 102, 116, 117, 137, 154, 157
87	15, 39, 50, 71, 96, 113, 135, 144, 201, 212, 233
88	42, 52, 66, 79, 141, 148, 242, 260, 265
89	41, 64, 111, 153, 158, 255, 267
90	2, 13, 30, 38, 49, 63, 65, 73, 94, 140, 159, 165, 168, 177, 183, 192, 195, 199, 205, 221, 247
91	1, 3, 17, 20, 43, 101, 108, 120, 138, 178, 214
92	6, 16, 33, 36, 73, 88, 103, 121, 122, 125, 136, 211, 257
93	10, 29, 51, 57, 106, 123, 150, 175, 208, 231, 236, 262
94	28, 46, 54, 60, 80, 95, 97, 162, 198, 203, 215, 222, 230, 239
95	4, 14, 18, 21, 22, 40, 72, 78, 131, 143, 161, 163, 170, 173, 179, 180, 182, 186, 197, 206, 224, 248, 268, 270
96	5, 11, 55, 213, 227, 251
97	13, 24, 28, 34, 55, 110, 134, 145, 189, 259, 261
98	114, 185, 204, 234
99	181, 194, 209
100	184, 210

Distribution of marks in Chart No. 56.

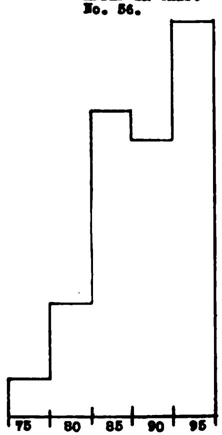


Chart No. 56. Average of 1st and 2nd Semesters of 270 pupils in Fresh. Math.

					129-	5*			
					137	12-	181*	96	
					141	18*	184*	97*	1*
					142	19	185*	102	3
					152-	20	189*	105-	4*
					153	24*	194*	106*	6*
	16*				158	25	195	108	7
	27-				159	26-	197*	110*	9
	33*	193-			166-	29*	198*	121*	10*
	35	196	98-	14*	167-	39	204*	123*	11*
	41	199	107-	17	168	51-	205	125*	21*
	71	200-	111	23-	172	55*	208*	127-	22*
	83	202-	112-	28*	180*	56	210*	131*	36*
	84	206*	116	30	182*	60*	212	132-	37*
	88*	207-	119-	31*	187	63	214	133-	40*
	90-	215*	122*	32	192	69-	215*	134*	42
	109-	217-	130	34*	201	70-	216-	138	46*
	113	218	135	38*	203*	74-	221	140	49
	118-	223-	136*	43	211*	76-	222*	143*	52
	124-	225	139-	44-	219-	77	224*	144	53
	126-	226-	146-	45-	220-	78*	227*	145*	58-
	147-	228-	150*	47-	237-	79	230*	148	61
	149-	231*	151-	48-	238-	80*	233	155-	62-
	174-	232-	160-	50	245-	82	234*	156-	64
2	179*	242	162*	54*	246-	86*	236*	157	65
8-	190	244-	169-	57	247	87-	239*	161*	68
13*	209*	250-	171-	59-	249-	99-	241-	163*	72*
15	229-	258-	176-	66	251*	101	248*	164-	73*
100	240-	260	177	67-	261*	103*	253-	165	75
115-	243-	264-	183	86-	262*	104-	255	170*	81
128-	252-	266-	186*	89-	263-	114*	257*	173*	91-
154	254-	268*	188	92-	265	117	259*	175*	94
235-	256	269	191-	93-	270*	120	267	178	95*
75	80	85			90			95	

Chart No. 57. Eighth Grade English of 270 pupils.

90 pupils — 90 pupils — 90 pupils

Mark	Pupils (top to bottom of column)
60	118, 167
61	
62	
63	95
64	126
65	156
66	89
67	228, 252
68	
69	
70	27
71	15
72	
73	
74	120, 229
75	51, 57, 71, 151, 200
76	41, 67, 86, 105, 142, 242, 254, 266
77	26, 44, 90, 115, 119, 237
78	87, 113, 196, 202, 250, 264
79	8, 25, 43, 45, 50, 62, 109, 147, 255
80	61, 75, 139, 159, 174, 183
81	48, 69, 92, 99, 138, 207
82	6, 37, 77, 88, 117, 134, 176, 195, 216
83	23, 47, 60, 70, 79, 81, 83, 91, 104, 149, 191, 201, 223, 236, 248, 260
84	29, 46, 55, 72, 102, 129, 194, 245, 252
85	259, 20, 35, 52, 65, 105, 107, 112, 122, 133, 154, 163, 164, 166, 168, 169, 187, 193, 212, 213, 217, 238, 246
86	7, 17, 21, 24, 31, 76, 100, 116, 127, 128, 144, 199
87	2, 3, 42, 53, 58, 84, 152, 209, 233
88	22, 59, 94, 98, 145, 155, 205, 226, 263
89	4, 16, 28, 39, 63, 73, 111, 141, 190, 197, 203
90	30, 38, 54, 53, 68, 74, 78, 101, 135, 146, 157, 160, 162, 171, 172, 180, 182, 185, 204, 206, 211, 214, 231, 240, 256, 267
91	108, 126, 150, 175, 218, 219, 247, 249, 262
92	1, 13, 14, 32, 33, 80, 82, 96, 97, 123, 136, 140, 192, 198, 215, 220, 224, 258
93	270, 9, 19, 49, 64, 65, 95, 137, 148, 153, 177, 210, 234, 251, 265
94	10, 12, 18, 34, 134, 178, 189, 208, 221, 225, 248, 257, 261
95	5, 36, 268, 106, 114, 121, 158, 161, 170, 173, 179, 186, 188
96	11, 85, 110, 131, 143, 130, 184, 230, 244, 259
97	40, 139, 181, 253, 255
98	222, 239
99	227, 241
100	165

Distribution of marks in Chart No. 58.

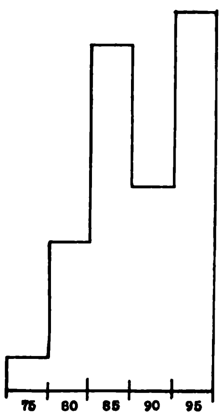


Chart No. 58. Average of 2 semesters of Fresh. Eng. of 270 pupils.

								188*	121*	
								192*	123*	1*
								194-	125*	3
			183-	79-	2			195-	127	4
			193	85*	7			197	131*	6-
			196-	86-	10*			198*	136*	9*
			206	89-	13*	120-	6*	199	137*	11*
			208*	90-	16	128	18*	203	138*	12*
			213	91-	17	130*	26-	204	139-	22
			216-	92-	19*	144	32*	205	140*	37-
			217	98	21	150*	34*	210*	141	40*
			225*	106*	23-	153*	36*	214	143*	52
			226	109-	27-	158*	38*	215*	145	53
	124-	8-	227*	111	28	168	42	220*	148*	55
	126-	14*	228-	114*	29	171	45-	221*	156	56-
	132-	20	236-	115-	30*	179*	62-	222*	161*	61-
	134*	24	237-	116	31	185*	65*	229-	162	68
	151-	25-	238	122	39	189*	69-	230*	163	70-
	154	33*	240	129-	43-	190	72-	233	165*	73
	160	35	242-	133	46	191-	74	234*	170*	80*
	166	41-	243-	135	48-	200-	76	235-	173*	81-
	167-	44-	245-	142-	49*	201-	77-	239*	175*	82*
	202-	47-	252-	146	50-	207-	83-	241*	176-	96*
15-	212	54	254-	152	51-	209	84	246	177*	101
64*	218*	60-	256	156-	57-	211	87-	247*	178*	105
71-	224*	67-	258*	157	58	219*	94	253*	180	107
100	232-	88-	260-	159-	59	223-	95*	255*	181*	108*
147-	250-	93-	261*	164	63	248*	99-	257*	182	110*
149-	251*	97*	264-	169	66	249*	102-	259*	184*	112
231	263	104-	265*	172	75-	262*	103-	267	185	117-
244*	266-	113-	269	174-	78	268*	119-	270*	187	118-
75	80		85			90			95	

Distribution of marks in Chart No. 59.

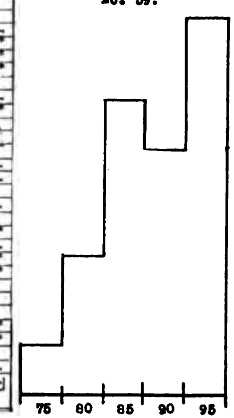


Chart No. 59. Average of 2 semesters of Soph. Eng. of the same 270 pupils.

									110*	1*
						125*	7*	188*	114*	3
						127	9*	189*	118-	4
						129-	11	194-	124-	5*
						130*	21	198*	131*	6-
						139-	24	205	135	10*
						157	28	210*	137*	18*
			191-	89-	2	165	29	211	138*	19*
			192*	90-	12*	168	31	215*	142-	26-
			196-	93-	20	176-	36*	219*	143*	32*
			200-	94	22	179*	38*	220*	144	34*
			203	95*	25-	190	40*	222*	148*	35
			204	97*	27-	193	44-	223-	155	37-
			206	113-	30*	195-	45-	224*	158*	42
	132-	13*	207-	115-	43-	197	46	230*	160	52
	134*	16	208*	120-	47-	199	49*	233	161*	53
	140*	23-	209	122	51-	201-	50-	234*	162	61-
	145	33*	212	126-	55	202-	59	239*	165*	65*
	150*	41-	213	133	56-	214	62-	241*	170*	68
8-	151-	54	217	136*	57-	216-	70-	243-	173*	72-
14*	152	75-	227*	141	58	221*	76	247*	175*	73
15-	154	92-	228-	146	60-	226	82*	253*	177*	74
17	166	99-	236-	149-	63	238	83-	255*	178*	78
39	172	100	237-	153*	64*	240	91-	257*	180	81-
48-	218*	104-	250-	156-	66	242-	102-	259*	181*	84
67-	225*	106*	251*	159-	71-	244*	103-	261*	182	85*
69-	229-	107	254-	164	77-	245-	111	262*	183-	96*
88-	231	109-	256	167-	79-	246	112	264-	184*	98
147-	232-	116	258*	169	80*	248*	117-	265*	185	101
260-	235-	119-	266-	171	86-	249*	121*	267	186*	105
263	252-	128	269	174-	87-	268*	123*	270*	187	108*
75	80		85			90			95	

Distribution of Marks in Chart No. 60.

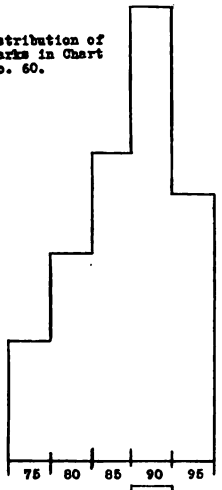


Chart No. 60. Eighth Grade Arith. of 336 pupils.

113 pupils				112 pupils				113 pupils			
6											
7			246		3	214	158	76			291
9			249	122	5	216	159	80	1		293
10			252	126	15	218	160	85	2		295
11	127	4	253	133	20	219	161	86	12		296
22	134	8	258	136	25	221	162	88	14		297
52	164	19	264	137	28	222	163	89	16		299
59	156	26	271	140	29	223	164	93	18		300
70	157	36	274	141	32	224	165	97	21		302
102	184	40	278	169	33	227	166	101	23		303
113	186	45	279	170	54	228	167	103	27		308
117	188	46	283	172	41	229	168	104	30		309
124	189	47	288	176	57	230	171	107	31		310
136	195	49	292	178	58	235	173	108	36		311
143	197	60	294	179	60	236	174	110	37		318
147	199	66	298	182	61	247	175	112	39		318
149	211	64	301	186	62	256	177	119	42		316
187	239	73	304	192	71	260	180	120	43		317
206	242	81	306	201	74	262	181	128	44		320
209	245	82	306	202	76	263	183	132	46		321
215	248	90	307	203	78	267	190	136	51		322
251	255	95	314	204	79	269	193	139	52		323
280	257	98	316	208	83	270	194	144	54		326
287	261	99	318	212	84	272	196	145	55		327
290	266	105	324	226	91	273	198	150	63		329
319	268	106	325	231	94	277	200	151	66		330
356	276	109	328	237	110	281	205	152	67		332
337	285	118	331	241	111	282	210	163	69		333
338	286	123	334	243	116	284	218	165	72		336
75	80			85		90		95			

Distribution of Marks in Chart No. 61.

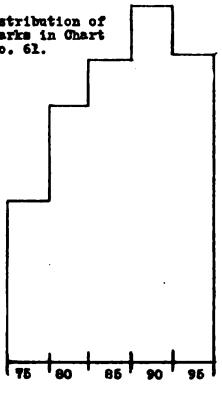


Chart No. 61. Average of Fresh. & Soph. Math of the same 336 pupils.

53%				35%				47%			
				253-	139*	35%			224	150	15*
				254*	141	11-			227	155	16
				264-	144	16*			229	156-	16*
				270	145	19-	262	163	230	157-	17*
		243-	116-	2*	275-	161	21*	263	164	72*	1*	232*	159	24*
	7-	247	122	3	276*	154-	25	267	166	78	4-	234*	160	27*
124-	8-	248-	133	6-	283-	168	40-	271-	172	79	5	237-	161	36*
126	22-	255-	136	10-	284	177	51*	274-	174	84	9-	243-	162	48*
127-	23*	257-	137	20	285-	180	55*	277	183	86*	12*	244*	165	54*
136-	26-	266-	148*	27*	286-	187-	60	279-	185	88*	14*	246-	167	67*
143-	32	268-	149-	29	293*	192	66*	280-	188-	89*	28	256	171	69
147-	33	276-	153	36-	298-	194	76	282	189-	90-	30*	268-	173	71
158	45-	281	169	39*	300*	201	86*	292*	191*	96-	31*	269*	175	74
170	47-	287-	176	41	301-	202	91	303*	197-	96*	34	260	179	77*
199-	50-	290-	178	44*	304-	203	98-	308*	200	97*	35*	265*	181	80*
209-	52-	291*	184-	54	305-	206-	102-	316-	207*	108*	42*	269	182	87*
215-	58	295*	186-	59-	309*	219	103*	318-	218-	114*	43*	272	190	92*
239-	61	296*	195-	64-	311*	220*	106-	321*	214	126*	46-	273	193	93*
241-	82-	297*	196	70-	312*	226-	106-	323*	218	128*	49-	286-	198	101*
261-	104*	302*	204	75-	313*	228	112*	326*	225	130*	58*	289*	210	107*
294-	109-	306-	205	81-	314-	233*	116	328-	226*	131*	56-	292-	213	110*
307-	111	322*	208	83	318*	235	119*	329*	240*	132*	62	310*	216	115
319-	113-	334-	211-	94	317*	236	121*	330*	245-	140*	63*	320*	217*	120*
324-	117-	335-	231-	99-	327*	249-	134-	331-	250*	142*	65*	333*	221	129*
325-	123-	338-	236*	100	336*	251-	136*	332*	252-	162	68	337-	222	146
75			80			85			90			95		

Distribution of Marks in Chart No. 62.

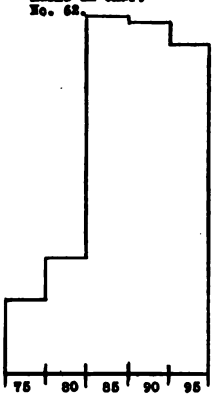


Chart No. 62. Eighth Grade Rec. of 502 pupils.

		245		100 pupils						
101 pupils	246	210	180	146	115	84	101 pupils			
	288	248	211	181	147	116	85			
	289	250	213	182	148	117	86	56	28	1
	290	252	214	183	149	118	87	57	29	2
	291	253	215	184	151	120	88	58	30	3
	292	254	216	185	152	121	89	59	31	4
	293	255	217	186	153	122	90	60	32	5
	294	256	218	187	154	123	91	61	33	6
	295	257	219	188	155	125	92	62	34	7
	296	258	220	189	157	126	93	63	35	8
	297	259	221	190	158	127	94	64	36	9
319	298	260	222	191	159	128	95	65	38	10
320	299	261	224	192	160	129	96	66	39	11
321	300	262	225	193	161	130	97	67	40	12
322	301	263	227	194	162	131	98	68	41	13
323	302	264	228	195	163	132	99	69	42	14
324	303	265	229	196	164	133	100	70	43	15
325	305	266	230	197	165	134	101	71	44	16
326	306	267	232	198	166	135	102	72	45	17
327	307	269	234	199	168	136	104	73	46	18
329	308	270	235	200	169	137	105	74	47	19
330	309	271	236	201	170	138	106	75	48	20
331	310	272	237	202	171	139	107	76	49	21
332	311	274	238	203	172	140	108	77	50	22
333	312	276	239	204	174	141	109	79	51	23
334	313	280	241	206	176	142	110	80	52	24
335	314	284	242	206	176	143	111	81	53	25
337	316	286	243	207	177	144	112	82	54	26
356	317	286	244	208	179	145	113	83	56	27
75	80		85		90			95		

Distribution of Marks in Chart No. 63.

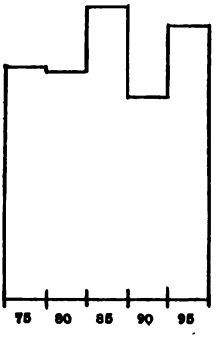


Chart No. 63. Average of Fresh. & Soph. Latin of the Same 502 pupils.

	59%			56%				64%		
266-										
269-	26*	192	24*							
273-	73*	197	33*							
278-	90*	200	46*							
280-	93*	201	47*				121	4*		
284-	110	205	60*	214	111	14*	122	11*		
286-	115	208	69*	215-	118	26*	126	19*	112	
288-	117	227-	83*	217-	126	28*	139	20*	116	35* 1*
289-	123	252-	88*	219-	132	42*	143	22*	116	38* 2*
293-	127	259-	95*	220-	137	46*	144	22*	128	39* 3*
295-	161	242-	109	221-	145	52*	147	36*	130	40* 5*
299-	169	244-	129	224-	148	55*	149	44*	134	41* 6*
301-	165	252-	131	234-	162	56*	163	49*	136	43* 7*
303-	166	255-	133	241-	163	57*	155	50*	141	45* 8*
306-	191	257-	136	245-	164	59*	161	53*	142	61* 9*
307-	196	258-	136	246-	168	64*	170	62*	152	64* 10*
310-	199	276-	140	259-	171	65*	180	70*	154	68* 12*
314-	203	290-	146	270-	172	66*	193	76*	169	61* 13*
316-	204	294-	157	295-	176	66*	196	82*	184	63* 16*
321-	211	297-	158	296-	177	72*	207	86*	210	67* 16*
325-	226-	300-	160	298-	181	76*	228-	87*	216-	72* 17*
326-	230-	305-	166	305-	183	79*	228-	89*	216-	74* 18*
328-	237-	306-	174	311-	187	81*	235-	96*	228-	77* 21*
330-	243-	309-	176	317-	190	84*	236-	98*	236-	80* 27*
331-	255-	312-	179	319-	194	92*	248-	99*	250-	86* 29*
332-	256-	315-	182	324-	196	94*	254-	104*	261-	91* 30*
333-	260-	320-	186	327-	202	100*	262-	106	264-	97* 31*
335-	263-	322-	188	334-	206	101*	267-	108	271-	102* 32*
336-	265-	323-	189	337-	213	107	285-	120	291-	106 34*
75		80		85			90		95	

Distribution of Marks in Chart No. 64.

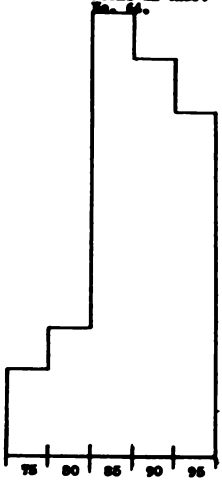


Chart No. 64. Eighth Grade Eng. of 338 pupils.

113 pupils				112 pupils				113 pupils			
		51%		43%			116	84		66%	
	287					149	117	85			
	288					150	118	86			
	289					151	119	87			
	290					152	120	88	56	28	
	291	260	235	206		153	121	89	57	29	1
	292	261	234	207	180	154	122	90	58	30	2
	293	262	235	208	181	155	123	91	59	31	3
	294	263	236	209	182	156	124	92	60	32	4
	295	264	237	210	183	157	125	93	61	33	5
	296	265	238	211	184	158	126	94	62	34	6
318	297	266	239	212	185	159	127	95	63	35	7
319	298	267	240	213	186	160	128	96	64	36	8
320	299	268	241	214	187	161	129	97	65	37	9
321	300	269	242	215	188	162	130	98	66	38	10
322	301	270	243	216	189	163	131	99	67	39	11
323	302	271	244	217	190	164	132	100	68	40	12
324	303	272	245	218	191	165	133	101	69	41	13
325	304	272	246	219	192	166	134	102	70	42	14
326	306	274	247	220	193	167	135	103	71	43	15
327	306	275	248	221	194	168	136	104	72	44	16
328	307	276	249	222	195	169	137	105	73	45	17
329	308	277	250	223	196	170	138	106	74	46	18
330	309	278	251	224	197	171	139	107	76	47	19
331	310	279	252	225	198	172	140	108	76	48	20
332	311	280	253	226	199	173	141	109	77	49	21
333	312	281	254	227	200	174	142	110	78	50	22
334	313	282	255	228	201	175	143	111	79	51	23
335	314	283	256	229	202	176	144	112	80	52	24
336	315	284	257	230	203	177	145	113	81	53	25
337	316	285	258	231	204	178	146	114	82	54	26
338	317	286	259	232	205	179	147	115	83	55	27
	75	80		85			90			95	

Distribution of Marks in Chart No. 65.

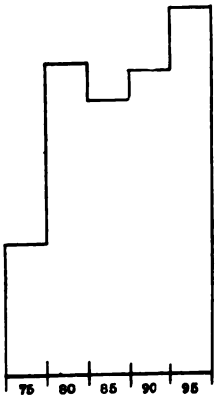


Chart No. 65. Average of Fresh.& Soph. Eng. of 338 pupils.

95*	56%			43%				66%			
118											
119									160	54*	
151									161	56*	1*
178									168	63*	2*
186									170	64*	4*
194	270-								171	67*	5*
206	275-	190	25*			177	85*		176	70*	6*
209	277-	196	33*			180	86*	3*	184	71*	7*
215	279-	197	45*	234-		187	87*	10*	191	74*	8*
263-	284-	200	59*	239-	125	22*	189	92*	13*	195	76*	9*
265-	286-	203	60*	241-	127	24*	192	94*	14*	195	82*	11*
266-	287-	210	78*	246-	129	37*	201	96*	20*	199	88*	12*
274-	288-	211	79*	251-	131	46*	202	104*	26*	204	89*	15*
279-	289-	214	113*	256-	132	52*	205	105*	27*	212	90*	16*
281-	292-	219	114	257-	134	56*	207	106*	28*	216	91*	17*
288-	296-	221	123	258-	135	57*	213	108*	32*	218	97*	18*
293-	297-	223	137	267-	136	61*	227-	116	34*	222	98*	19*
299-	304-	225	140	271-	149	62*	230-	120	35*	224	99*	21*
300-	311-	232-	146	278-	155	69*	231-	124	42*	226-	101*	23*
301-	313-	237-	160	278-	158	72*	233-	126	44*	229-	107*	29*
303-	316-	240-	156	280-	164	73*	236-	128	46*	236-	109*	30*
306-	318-	243-	167	293-	167	80*	238-	133	49*	245-	111*	31*
312-	321-	244-	169	294-	173	81*	242-	136	53*	248-	115*	36*
316-	328-	247-	163	305-	174	93*	253-	143	55*	249-	116	38*
320-	329-	250-	165	307-	175	100*	264-	144	56*	255-	130	39*
325-	330-	252-	166	309-	188	102*	276-	148	56*	260-	139	40*
324-	331-	254-	179	314-	196	103*	285-	152	60*	261-	141	41*
326-	333-	259-	181	317-	208	110*	290-	154	75*	291-	142	43*
329-	336-	263-	182	319-	217	117	302-	162	77*	296-	145	47*
332-	336-	266-	183	326-	220	121	308-	169	83*	296-	147	50*
336-	337-	269-	185	334-	228-	122	310-	172	84*	327-	153	51*
	75	80			85		90			95	

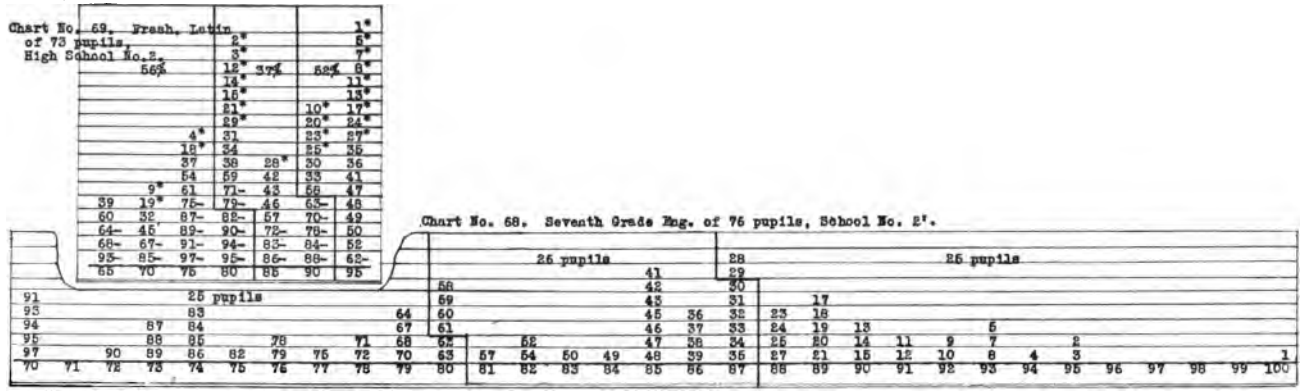
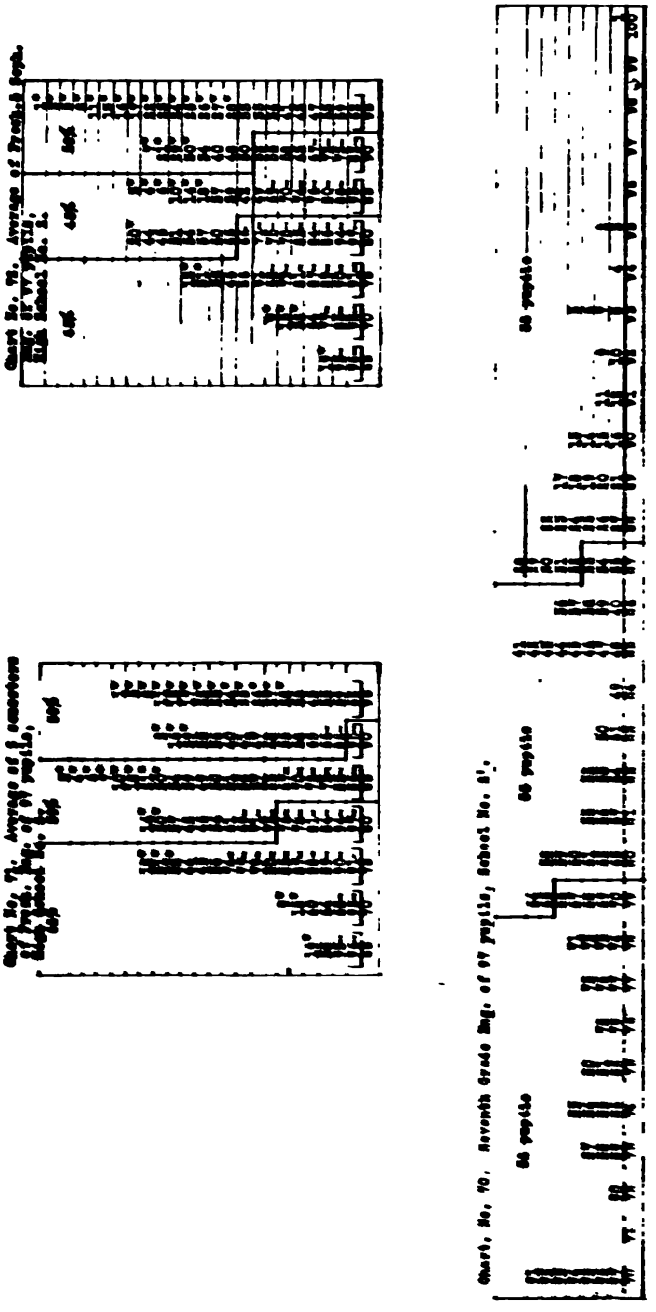


Chart No. 69. Fresh. Latin of 73 pupils High School No. 2.
56%
37%
62%
25 pupils
Chart No. 68. Seventh Grade Eng. of 76 pupils, School No. 2'.
26 pupils
28
25 pupils
Chart No. 67. Average on Fresh. & Soph. Math of 97 pupils, High School No. 2.
46%
36%
62%
32 pupils
Chart No. 66. Seventh Grade Arith. of 97 pupils, School No. 2'.
33 pupils
18
32 pupils



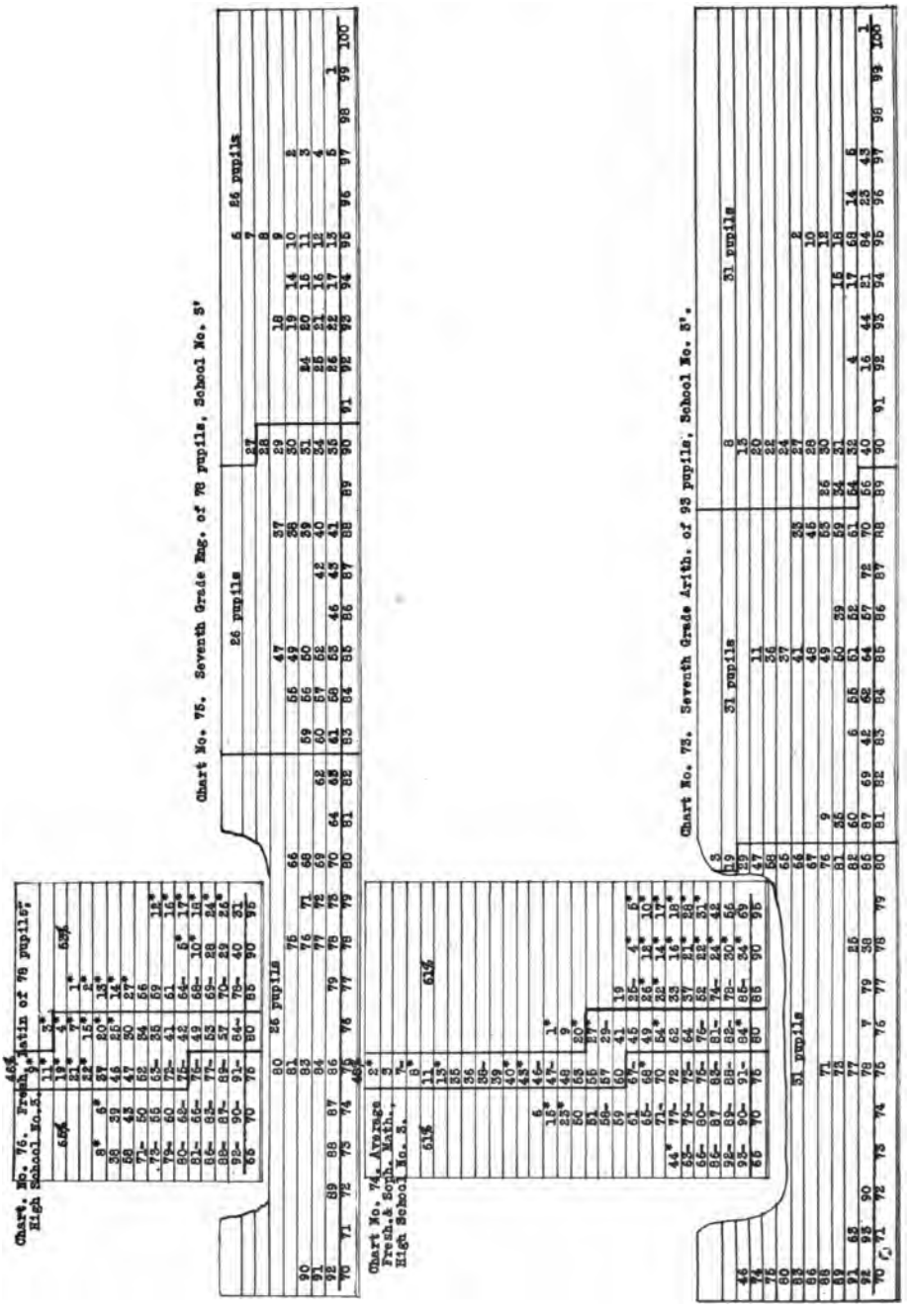


Chart. No. 76. Fresh. Latin of 78 pupils' High School No.5.
Chart No. 76. Seventh Grade Eng. of 78 pupils, School No. 5'
26 pupils
26 pupils
26 pupils
Chart No. 74. Arrange Fresh. Eng. Math., High School No. 3.
Chart No. 75. Seventh Grade Arith. of 93 pupils, School No. 5'.
31 pupils
31 pupils
31 pupils

Chart No. 78. Average of 2 semesters Fresh. Eng. of 93 pupils, School No. 8.

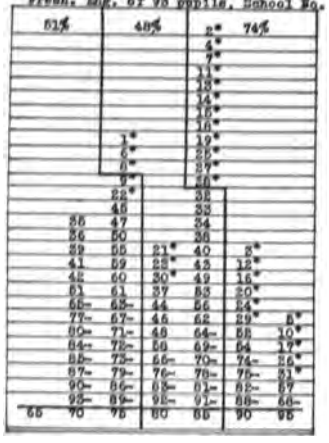


Chart No. 79. Average of Fresh.& Soph. Eng. of 93 pupils, High School No. 9.

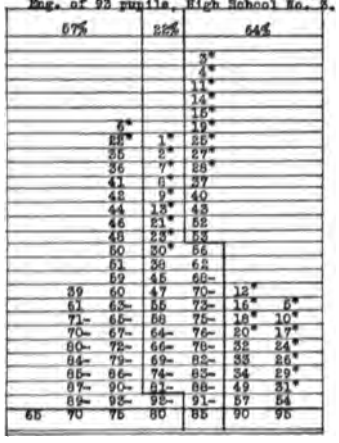


Chart No. 77. Seventh Grade Eng. of 93 pupils, School No. 3.

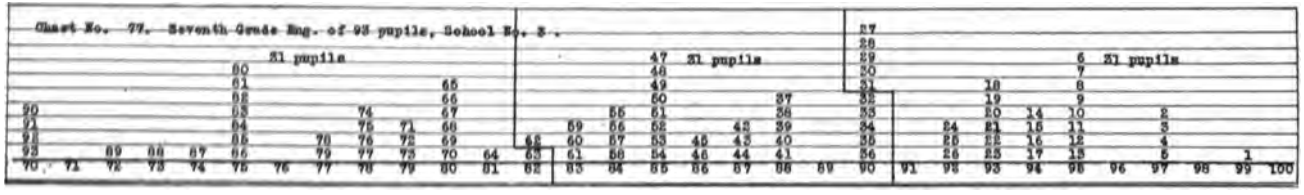


Chart No. 81. Average of 2 semesters Fresh. Eng. of 73 pupils, High School No.4.

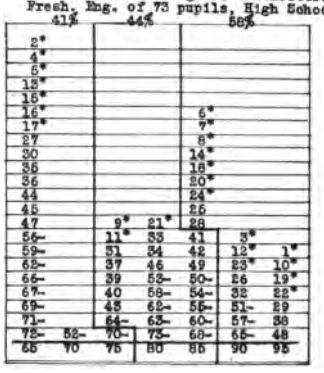


Chart No. 82. Average Fresh. & Soph. Eng. of 73 pupils, High School No.4.

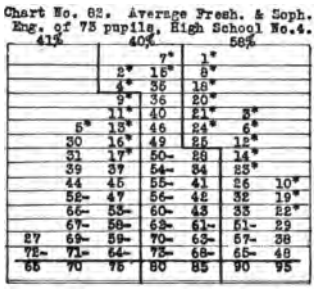


Chart No. 80. Seventh Grade Eng. of 73 pupils, School No. 4.

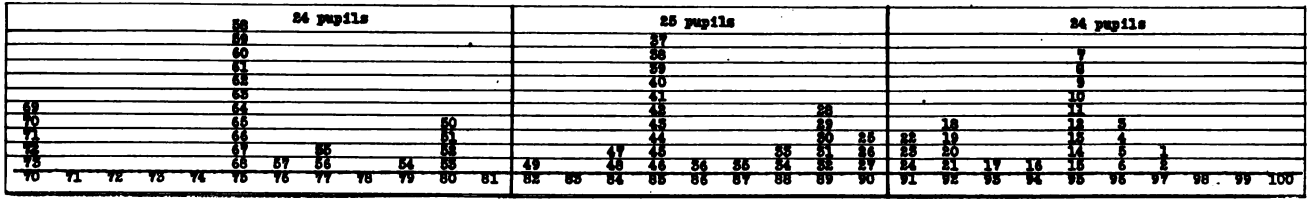


Chart No. 85. Seventh Grade Math. of 299 pupils of Schools No's.2',3',4'.

Group	Mark	Pupils
100 pupils	70	46, 74, 75, 80, 83, 86, 88, 89, 91, 92, 185, 205, 222, 225, 226, 276, 286, 294, 296, 299
	71	63, 93, 218
	72	90, 208, 214
	73	77, 194, 195, 206, 209, 221
	74	115, 212, 215, 290
	75	71, 73, 78, 105, 120, 184, 190, 193, 259, 263, 278, 283, 288, 293
	76	7, 158, 262
	77	79, 161, 223, 264
	78	25, 38, 168, 172
	79	116, 187, 192, 250, 292
	80	8, 19, 29, 47, 58, 65, 66, 67, 76, 81, 82, 85, 99, 113, 160, 183, 189, 200, 203, 227, 229, 277, 279, 284, 287, 295
	81	9, 60, 87, 112, 149, 162, 282
99 pupils	82	69, 128, 178, 197, 219, 291
	83	6, 42, 158, 175, 199, 202, 204, 216, 217, 274
	84	55, 62, 179, 181, 182, 246, 267, 289
	85	11, 36, 37, 41, 48, 49, 50, 51, 64, 94, 95, 96, 127, 129, 167, 171, 177, 186, 198, 213, 220, 234, 235, 237, 261, 265, 268, 269, 270, 271, 272, 273, 297, 298
	86	39, 52, 57, 102, 126, 164, 191, 207, 254
	87	72, 100, 103, 125, 141, 151, 155, 196, 243, 248, 257, 280
	88	35, 45, 53, 59, 61, 70, 101, 163, 166, 169, 252, 266
	89	26, 34, 54, 56, 118, 121, 147, 150, 152, 154, 170, 176, 188, 210, 240, 245, 255, 281
100 pupils	90	8, 13, 20, 22, 24, 27, 28, 30, 31, 32, 40, 111, 119, 143, 145, 153, 156, 160, 251, 253, 256, 258, 275, 285
	91	35, 110, 114, 146, 157, 228
	92	4, 16, 107, 122, 131, 136, 139, 201, 238
	93	44, 108, 140, 142, 148, 159, 165, 247
	94	15, 17, 21, 104, 109, 117, 124, 231, 244, 260
	95	2, 10, 12, 18, 68, 84, 97, 98, 133, 135, 144, 211, 233, 236, 241, 249
	96	14, 23, 134, 137, 173
	97	5, 43, 123, 130, 132, 174, 230, 239, 242
	98	106, 232
	99	224
	100	1

Distribution of
Marks in Math,
High Schools No's.2,3,4.

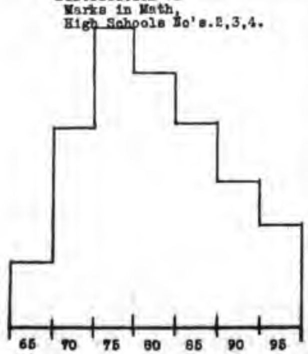
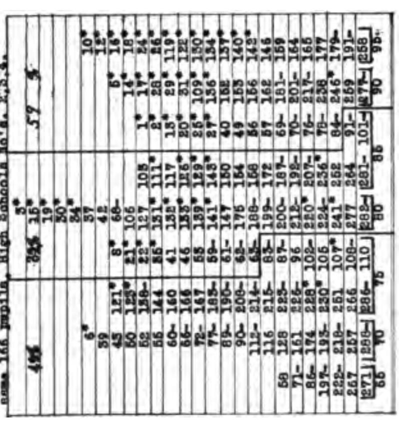


Chart No. 84. Average of Fresh. & Soph. Math. of the same 299 pupils,
High Schools No's. 2, 3, 4.

											171	19-			6*
		45%						33%			177	25-	51%		10*
											181	26*			17*
											183-	32*			18*
								213	110*	1*	184-	33			28*
								217	114*	9-	187-	37			31*
				235	141	57		226-	118*	20*	188	52			42
				248	147*	60-	2*	228*	127*	27*	191	74-	164	4*	56*
	225-	90-		251*	148*	67-	3-	229-	123*	29-	195-	78-	157*	12*	69
44*	231*	95	6	252	166	68*	7-	239*	131*	41	197	85-	167	14*	119*
63-	237	96	15*	254	169	70	8*	241*	136*	45	211*	104*	172-	16*	122*
65-	247*	106*	23*	257	174*	72	11	242*	138-	49	212-	108*	176	21*	130*
86-	253*	107*	50	262-	175	73-	13*	243	144*	54*	214-	113-	178	22*	134*
92-	256*	115-	51	270	180-	75-	35*	244*	149-	62	215-	117*	179	24*	135*
93-	260*	125	58-	273	186	83-	36	250-	161-	64	223-	132*	198	30*	137*
105-	265	160*	59	276*	190-	88-	38-	255	182	76-	233*	133*	201*	34*	139*
112-	266	168-	61	282-	192-	91-	39	261	184-	81-	234	150*	202	109*	140*
126	268	173*	65-	283-	196	97*	40*	263-	199	82-	238*	151	220	124*	142*
218-	271	185-	71-	288-	209-	99-	43*	267	200-	84*	246	153*	232*	126	162-
259-	279-	193-	77-	290-	210	101	46-	274	203-	94	249*	155	236*	129	163
272	281	205-	79-	292-	219	111*	47-	276-	204	98*	264-	156*	240	143*	165*
295-	284-	216	80-	293-	224*	116-	48	277-	206-	100	269	158	258*	145*	170
296-	285*	221-	87-	297	227-	120-	53	286-	207	102	278-	159*	280	146*	189-
298	294-	222-	89-	299-	230*	127	55	289	208-	105	287-	164	291-	152*	245
65		70				75			80		85		90		95

Chart No. 86. Average of Fresh. & Soph. Latin of the same 166 pupils, High Schools No's. 2,3,4.



Distribution of Marks in Latin, High Schools No's. 2, 3, 4.

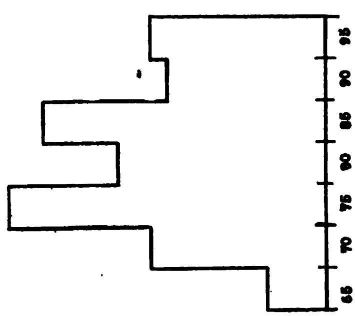
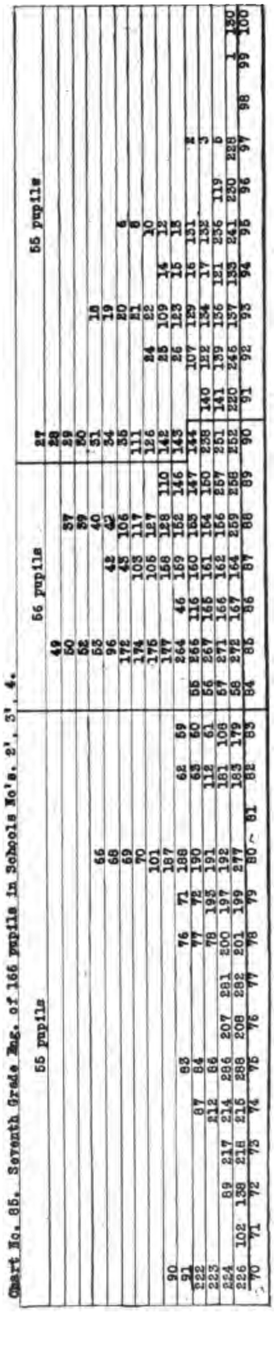


Chart No. 85. Seventh Grade Eng. of 166 pupils in Schools No's. 2', 3', 4.



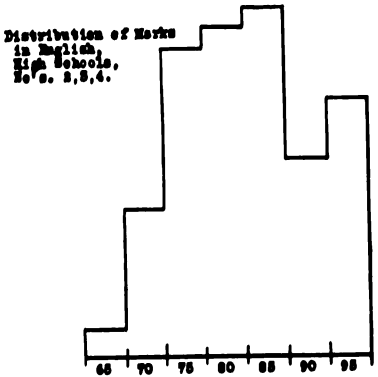
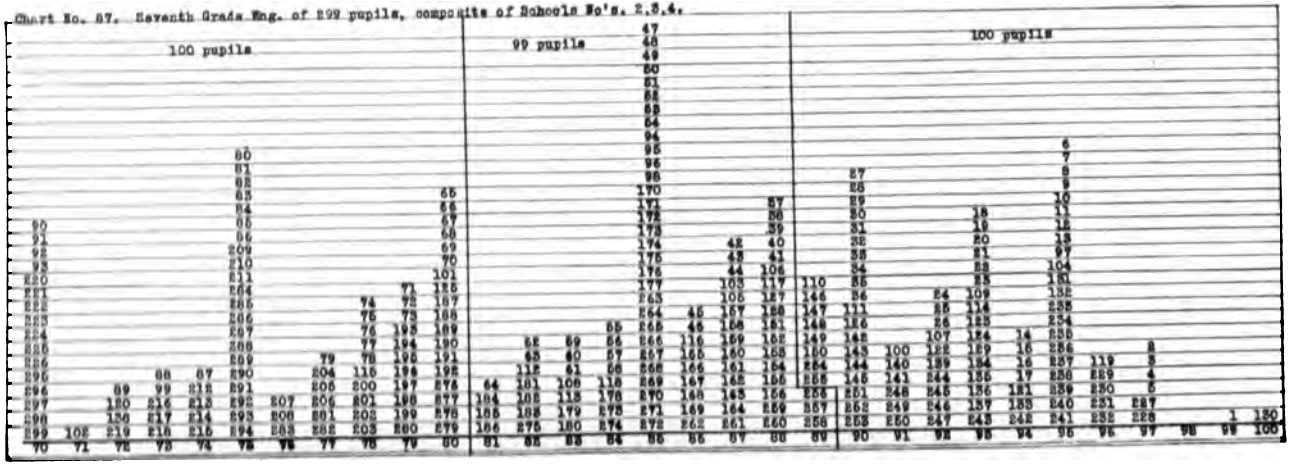


Chart No. 86. Average of Fresh.& Soph.Eng. of the same 299 pupils, High Schools No's 2,3,4

Chart No. 87. Seventh Grade Eng. of 299 pupils, composite of Schools No's. 2,3,4.



SEC. IV. SOME COMPARISONS OF HIGH SCHOOLS AND COLLEGES

This section includes a comparison of the relative standing of pupils between high schools and colleges, together with some comparisons on the basis of absolute marks.[1]

The object of this section is to discover as nearly as possible what the actual existing relation is between high schools and colleges, and then farther along, on the basis of these results and those found in sec. V, attempt to determine about what should really be expected to be the extent of correlation between the secondary and higher institutions of learning.

The variety of the systems of grading used in the following schools concerned, here again, as before, so complicates the process of comparing schools that it is not possible to draw conclusions without allowing for some modification of statements relative to the results.[2]

A general tendency, previously noted, is obvious when we compare such graphs as 89, 91′, 101, 103, 105, 107, 109, or some of the smaller graphs representing the 23 different high schools in chart 109A or 117 in the advance section; namely, that the great majority of the distributions of high-school marks tend to skew toward the top of the scale. This may be partly accounted for by the fact that none of the records of eliminated students are included, but in spite of this explanation it may be in part due also to the use of a too-narrow range of estimates.

Taking up more in detail some of the graphs representing the distributions of marks, it may be noted that the skew in chart 89 is much more exaggerated in case of the Freshman year than it is in the average of three years of English of precisely these same pupils as shown in chart 91. But do not charts 90 or 92 indicate that the rating in chart 91 is probably more justifiable than that in 89, since the high-school Freshman

[1] Since a three-estimate basis of marking practically amounts to ranking students, a few schools were charted and compared on the basis of the original grouping rather than by dividing them into equal tertile groups. The width of the broken base lines in charts 101, 102, 103, 104, 105, 106 indicates as well as the graphs the upward-skewing tendency in the high school and college already pointed out in the discussion.

[2] College No. 1 uses marks, 1, 2, 3, to represent students' standings from high to low, and these stand respectively for 90–100, 80–90, 70–80 per cent. College No. 2 uses the percentage system, ranging from 70–100; college No. 3 uses the letters A, B, C.

High school No. 1 uses the number system, 1, 2, 3, indicating respectively 95–100, 85–95, 75–85 per cent. Other high schools, as, for example, No. 7, No. 6, No. 5, use numbers, letters, and the ordinary percentage system, respectively.

class as a group does not hold its position in the Freshman year of college? And furthermore, the 86 pupils out of these 266 represented in chart 91′ who go on to college and graduate, as a group, hold their place pretty well, as shown in the graph for chart 92′.

The 81 pupils who go on to college No. 2, represented in charts 93, 95, and 97, are taken from the previous group of 212 pupils in school No. 5. Numerous marks toward the lower end of the scale here occur, as was previously the case, with the whole group. When chart 99, representing Freshman-Sophomore mathematics, is compared with the above charts, it indicates that the standards are somewhat different in the two departments.

Again, the shifting of the whole group of pupils in college mathematics toward the lower end of the scale, as shown in chart 100, indicates that the two institutions are not using similar standards. For in chart 99 the pupils are grouped about the upper end of the scale. Charts 84, 96, or 98 indicate a sort of bimodal distribution, with a somewhat larger number of marks toward the top of the scale, while in chart 100 marks are more numerous toward the lower end. Consequently the departments within college No. 2 are using different standards, although these are more alike than those used by the high school and college.

Graphs 101–9 indicate on the whole that either the standards of the two institutions are not similar or that the students who go from the high schools are not strong enough to maintain, as a group, their positions. Whenever there has been any considerable number of pupils involved in these comparisons, in very few instances do the graphs show a normal distribution of high-school pupils, examples of which, not before used, are charts 101, 103, 105, 107, indicating absolute marks; while on the other hand college No. 1, as evidenced by graphs 102, 104, 106, 108, has in the majority of cases distributed its marks somewhat according to the normal curve.

A very brief discussion of some of the charts representing the 23 different high schools, together with composite charts of these same pupils, will furnish some notion of the relation of these schools to college No. 1. See charts 107–9A.

After finding out the standing of these pupils in terms of percentage, they were translated into terms of 1, 2, 3, and then charted and graphed, separately, in the first instance, as well as charted and graphed in composite form later.[1]

[1] The percentage system is used in practically all of these high schools. Since college No. 1 uses the marks 1, 2, 3, it was thought that it would be interesting to find

Schools Nos. 22, 25, and 5 are exceptions to the skew upward.[1] While schools Nos. 5 and 22 hold their positions in the college or probably improve as a group, school No. 25 as a group does not do so well in maintaining its relative position. School No. 21 has a peculiar rectangular distribution which is hardly possible with any large number of pupils, but this group, too, improves as a whole in the college. The different relations between the standings of the high-school pupils in schools Nos. 35 and 18, and in college No. 1, either show a difference in the use of standards by the college, or it shows that high school No. 25 is the weaker of the two.

It might be concluded from the graphs in chart 109A that in such schools as Nos. 12, 23, 14, 15, 17, 20, 8, 24, 27 only the stronger pupils enter college, if it were not for the distribution of marks which occurs during the Freshman year of college work. It may be noted that the groups as a whole shift toward the lower end of the scale in college No. 1.

The actual percentage ratings were charted in chart 109 to indicate that the translation of the percentages to 1, 2, 3 did not distort in any way the grouping of the marks. For chart 107 shows the same tendency through its graph to skew toward the top as is found in chart 109. And while there are exceptions to this tendency, found in the separate graphs of the 23 schools, yet the composite charts 107 and 108 warrant the statement that there is a more normal distribution of grades in college No. 1 than in the 23 high schools considered as a whole.[2] As has been said relative to previous charts, so here it may be reiterated that it is possible to determine what the relative standing of individuals is, as well as of the group, by following out the numbers accompanied by the characters plus and minus. For illustration, in high school No. 11 out of the 15 pupils who had a standing of 1 in the high school, 6 retained this standing in the college, 7 of them

out from all the principals concerned precisely what is the range of the scale used in the various high schools, and exactly what percentages which they do use are equal to the 1, 2, 3 marks of the college.

From this investigation it was learned that the large majority of the high schools are using a range of 70–100 per cent, in which 1 equals 90–100; 2, 80–90; 3, 70–80. In the other several schools 1 equals 90–100; 2, 80–90; 3, 75–80; or 1 equals 90–95; 2, 85–90; 3, 80–85; or 1 equals 95–100; 2, 85–95; 3, 75–85; or A+ equals 97–100; A, 90–97; B+, 85–90; B, 80–85; C, 70–80.

[1] The 23 high schools do not appear in any logical order because it was necessary to rearrange the charts for the purpose of printing them.

[2] Charts 107 and 108 have been used in finding the retention between the composite 23 high schools and college No. 1.

fell back to the standing represented by 2, and 2 of them fell back to a standing of 3. The fact just pointed out is indicated by the accompanying stars. This indicates that the standards of the two institutions are not the same, and probably, too, that not all of the high-school pupils are able to do the work according to the standard set up. It may mean that the standard of the college ought to be modified, together with the standards of the high schools.

Since pupils need to readjust themselves whenever they enter different institutions, it was thought that it would be of some significance to compare the first year of the high-school English with the first year of college English, as well as to make the comparison between the average of the three years' high-school English and the Freshman college

Fr. Eng. H. S. No. 1	Col. No. 1 Fresh. Eng. Charts 89, 90				
	1	2	3	Ter. Ret.	
1	50	34	5	56.18	
2	29	28	31	31.81	
3	11	23	55	61.79	
	Tot. Ret.			50.00	

Av. 3 yrs. H. S. Eng.	Col. No. 1 Fresh. Eng. Charts 91, 92				
	1	2	3	Ter. Ret.	
	59	27	3	66.28	
	24	38	26	43.40	
	6	23	60	67.41	
	Tot.Ret.			59.02	

Fresh. Eng.	Col. No. 2 Fresh. Eng. Charts 93, 94				
	1	2	3	Ter. Ret.	
	10	13	4	37.07	
	11	6	10	22.22	
	6	8	13	48.14	
	Tot.Ret.			36.80	

Avr 3 yrs H.S. No. 1 Eng	Col. No. 1 Aver. of 4 yrs Charts 91', 92'			
	1	2	3	Ter. Ret.
	18	7	4	62.06
	11	13	4	44.82
	0	8	21	68.96
	Tot7Ret.			60.46

So. Eng. H. S. No. 5	Col. No. 2 Fresh. Eng. Charts. 95, 96				
	1	2	3	Ter. Ret.	
1	14	10	3	51.85	
2	8	12	7	44.44	
3	5	5	17	68.00	
	Tot. Ret.			53.08	

H.S. 5. Av. 4 yrs. Eng.	Col. No. 2 Fresh. Eng. Charts. 97, 98				
	1	2	3	Ter. Ret.	
	14	11	2	51.85	
	9	8	10	29.62	
	4	8	15	55.56	
	Tot.Ret.			45.67	

H.S. 5. Fr. & So. Math.	Col. No. 2 Fresh. Math. Charts 99,100				
	1	2	3	Ter. Ret.	
	8	5	7	40.00	
	9	7	4	35.00	
	3	8	9	45.00	
	Tot.Ret.			40.00	

Table VIII showing summary of the relative standing of pupils in high school and college

English. Table VIII indicates that the total retention is 59.02 per cent in the latter comparison and 50 per cent in the former, which probably signifies, in harmony with statements already made, that it takes the high-school student some time to get adjusted in his first year's work. A further comparison in charts 91′ and 92′ of the three years' average of high-school English with the four years of English taken in college corroborates this statement. For the 86 pupils out of these 266 show a somewhat similar retention to that in charts 91 and 92, namely, 60.46 per cent, as is shown in table VIII.

The results of the comparisons in charts 93 and 94, together with the results in charts 97 and 98, as shown in table VIII, also justify the former statement. The total retention for high school No. 5 and college No. 2

is 53.08 per cent between the Sophomore high-school English, and Freshman college English; the total retention between Freshman high-school and Freshman college English is low, namely, 35.80 per cent; while that between the four years' average and the Freshman college English is 45.67 per cent.

On the basis of the single subjects compared, the results warrant the conclusion that the correlation between the high school and college is better for high school No. 1 and college No. 1 than it is for high school No. 5 and college No. 2.

The amount of retention for the schools compared on the basis of absolute marks is somewhat similar to that of the comparisons on the basis of the relative standing, as shown in table IX. The total retention for English between high school No. 7 and college No. 1 is 53.57

Fr. Eng. H. S. No. 7	Col. No. 1				
	Fr. Eng Ch. 101, 102.				
		I	II	III	Div. Ret.
	1	26	23	3	50.00
	2	4	15	5	62.50
	3	2	2	4	50.00
	Tot. Ret				53.57

Fr. Math. H. S. No. 6	Col. No. 3				
	Fr. Col. Math Ch. 103, 104.				
		A	B	C	Div. Ret.
	E	52	28	17	53.60
	G	11	48	11	68.57
	F	2	4	11	64.60
	Tot. Ret.				60.32

Fr. Eng. H. S. No. 6	Col. No. 3				
	Fr Eng Ch. 105, 106.				
		A	B	C	Div. Ret
	E	41	45	15	40.95
	G	6	24	19	48.97
	F	2	7	6	40.00
	Tot Ret				43.00

TABLE IX

Showing retention between high school and college on basis of absolute marks.

per cent. This is higher than is the retention for English between high school No. 6 and college No. 3, which was found to be 43 per cent. The high retention of 60.32 per cent in mathematics for school No. 6 may be due to the fact that these pupils have been a select body with a special interest in mathematics. It may be due to the fact that the standards of the two colleges are different.

Composite charts 107 and 108 represent pupils from 23 different high schools, who go on to college. The total retention in the subjects of English on the basis of absolute marks is 53.30 per cent.[1] The exact retention for high school No. 1 and college No. 1 between Freshman high-school English and Freshman college English is 77.52 per cent; between the three years' average of high-school English and the Freshman college English, 88.76; between the three years' average of high school and the four years' average of college English, 87.93;

[1] The exact retention for each division is as follows: 45.91 per cent for division I; 28.57 for division II; and 71.73 for division III. Retention here is based upon the number of pupils in the original groups respectively.

for high school No. 5 and college No. 2, between Freshman high-school English and Freshman college English, 64.81; between Sophomore high-school and Freshman college English, 74.07; between the four years' average of high-school and Freshman college English, 75.92; between Freshman-Sophomore mathematics and Freshman college mathematics, 60 per cent.

The result of the comparisons made between high school No. 1 and college No. 1 in a single subject, English, expressed in terms of the average of the percentage of the pupils in the high and low tertiles who remain in the upper and lower halves respectively in the college groups is a retention of over 80 per cent. The result of the comparisons made between high school No. 5 and college No. 2 shows a lower retention, namely, somewhere near 70 per cent. These results will be supplemented in sec. V.

From the above results it may be concluded that the retention between high school and college is between 75 and 80 per cent.

Graph showing distribution of marks in English, High School No. 1.

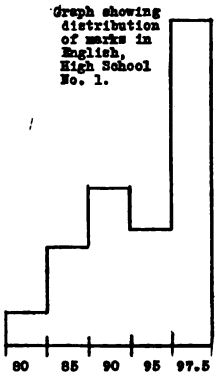


Chart No.89. Average of 2 semesters in English of 266 pupils, High School No. 1.

89 pupils.					88 pupils.				89 pupils.				
						121	24						
						130	51	180	160	85	45	20	
			219	134	25	141	54	181	161	86	46	21	1
	140	61	220	143	42	203	55	182	162	89	47	22	2
	142	66	221	144	78	204	57	183	163	90	48	23	3
	147	68	222	145	73	205	62	184	164	91	49	26	4
	149	71	227	146	77	208	70	185	165	94	50	27	5
	153	74	229	148	83	211	76	186	166	97	51	28	6
	154	78	230	198	88	212	79	187	167	103	52	29	7
41	156	80	234	199	92	215	81	188	168	110	53	30	8
120	251	93	237	200	95	223	84	189	169	116	56	32	9
124	252	109	239	201	96	224	87	190	170	119	58	33	10
133	254	111	240	202	99	225	98	191	171	125	59	34	11
161	256	113	242	207	100	226	101	192	172	126	60	35	12
187	256	118	244	209	104	228	102	193	173	128	63	36	13
206	257	122	245	210	112	231	105	194	174	132	64	37	14
253	259	135	246	213	117	232	106	195	175	150	65	38	15
256	260	136	247	214	123	233	107	196	176	152	67	39	16
262	261	137	248	216	127	235	108	197	177	155	69	40	17
265	263	138	249	217	129	236	114	238	178	158	75	43	18
266	264	139	250	218	131	241	116	248	179	159	82	44	19
80	85		90			93				97.5			

Graph showing distribution of marks in English of same 266 students. College No. 1.

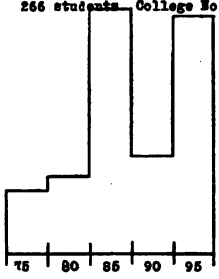


Chart No. 90. Fresh. English of the same 266 students, College No. 1.

61%						31%				56%				
				230-	162*	112	80-	24	128*	3*	187	143-		
				232	166*	113-	83	25	135-	18*	188	146-	89*	22*
				233	167*	114	84	27*	146-	20*	189	152*	92	26*
			200-	234-	172	115	86*	35*	154-	21*	190	157-	93*	28*
			203	56-	235	173	116*	87	37*	180	23*	192	159*	77
			208	67*	236	175	120-	88	38*	186	33*	193	160*	79
136-	41-	211	68-	241	178	121	89*	39*	194	34*	195	163*	82*	31
139-	71-	218-	70	246-	181	122-	91*	42	205	43*	196	164*	90*	32*
149-	76	220-	78-	248-	185	123	93	46*	212	48*	197	165*	101	36*
166-	96	228-	100	250-	191	126*	94*	58*	225	49*	201-	168*	102	40*
198-	99	223	108	251-	199-	134-	95	60*	226	50*	208-	169*	105	44*
206-	117	229-	137-	253-	207-	138-	97*	61-	227-	54	204	170	110*	45*
217-	124-	238	142-	254-	210-	145-	98	65*	239-	57	209-	174	116-	47*
219-	127-	242-	144-	255-	213-	150*	104	69*	240-	64*	216-	176	119*	51*
227-	129-	243-	147-	263-	214-	161-	106	72	243	81	228	179	125*	52*
252-	130	256-	158*	264-	215	165-	107	73	247-	86*	231	182	132*	53*
258-	131-	259-	171	265-	221-	166*	109-	74-	249-	93-	244-	183	140-	55
261-	133-	260-	177	266-	224	161*	111-	75*	257-	103*	262-	184	141	56*
75		80				85			90			95		

Graph showing distribution of marks in English of 266 pupils, in High School No. 1.

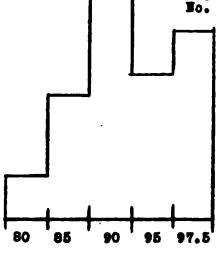
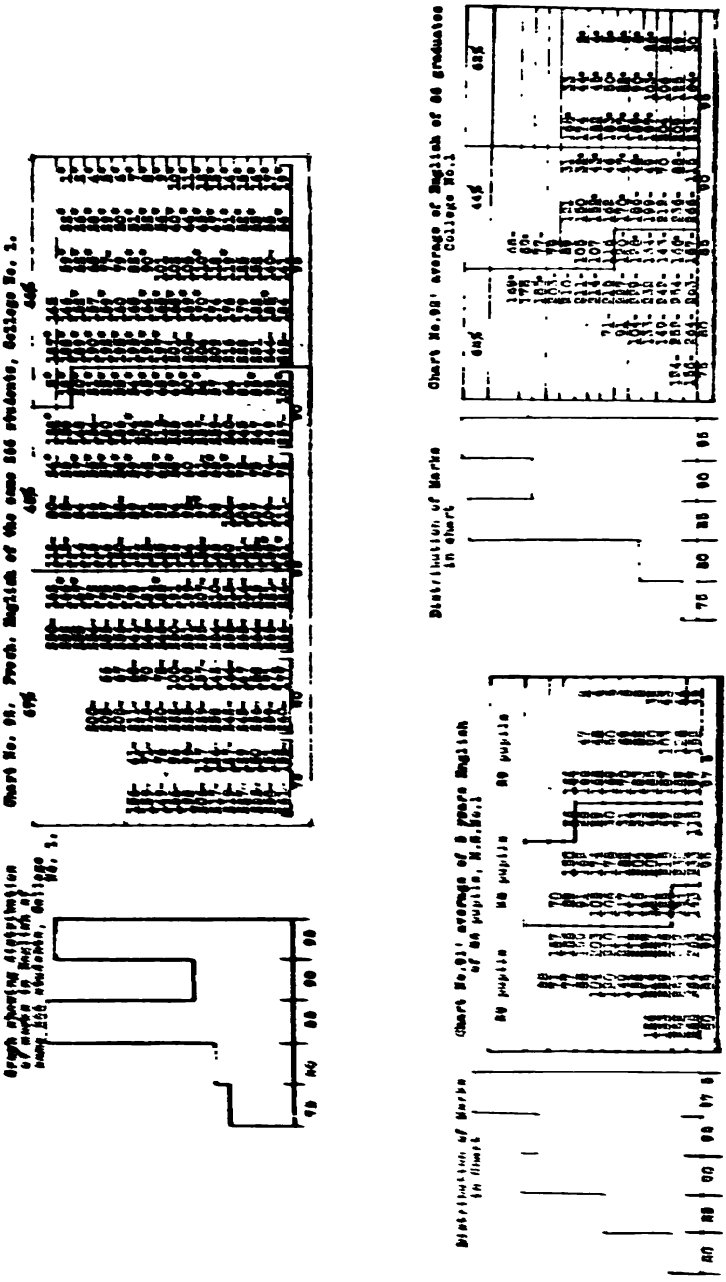


Chart No. 91. Average of 3 years in English for each of the 266 pupils, High School No. 1.

89 pupils				88 pupils				89 pupils			
149								152	36	1	
153	61							156	37	2	
154	68	210		143				159	38	3	
156	71	211		145	101	25		161	39	4	
206	74	212		146	108	42		164	40	5	
213	77	217		147	106	86	182	62	20	166	43
214	78	220		148	107	87	184	65	21	166	44
41	218	80	221	157	108	60	191	67	22	167	45
75	219	83	227	158	114	64	204	75	24	168	47
111	222	88	230	172	116	66	205	79	26	169	48
113	223	95	234	173	117	70	209	81	28	170	50
122	224	99	235	177	118	73	215	102	29	183	52
124	229	100	236	180	121	76	216	116	30	186	53
133	245	104	237	181	123	84	225	160	31	187	63
139	250	109	239	186	125	86	226	160	33	188	69
142	251	112	240	199	126	87	228	162	34	189	82
151	253	120	241	199	129	89	231	163	46	190	85
252	254	127	242	200	130	91	232	171	54	192	90
256	255	136	244	201	131	92	233	174	61	193	97
259	256	137	246	202	132	93	236	175	49	194	103
261	257	138	248	203	134	94	243	176	56	196	110
265	260	140	262	207	135	96	247	178	58	196	119
266	264	144	263	208	141	98	249	179	59	197	128
80	85			90				95		97.5	



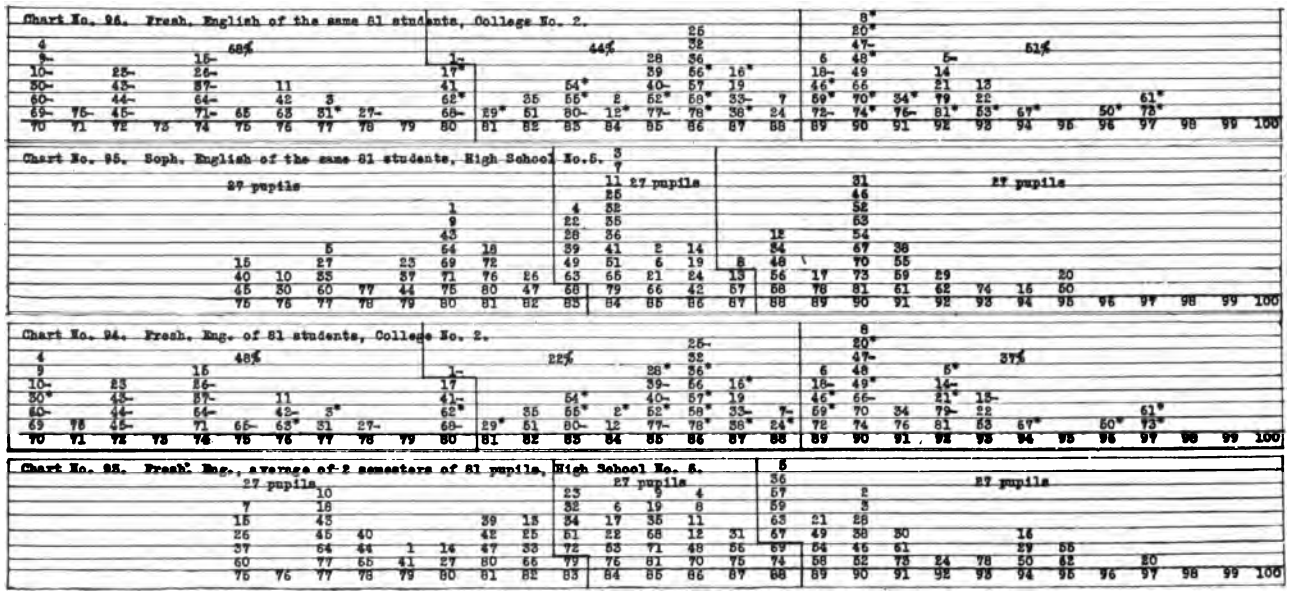
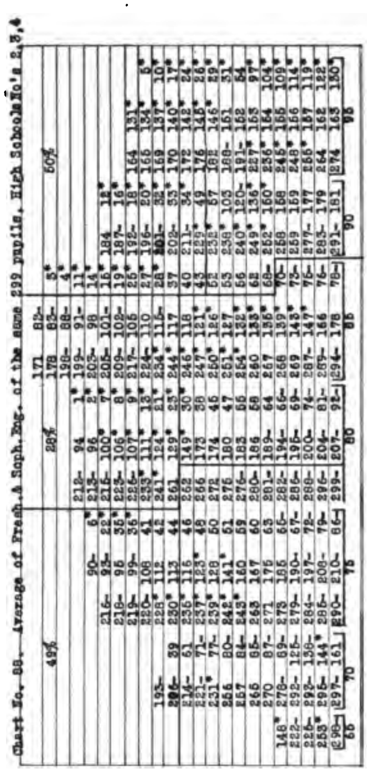
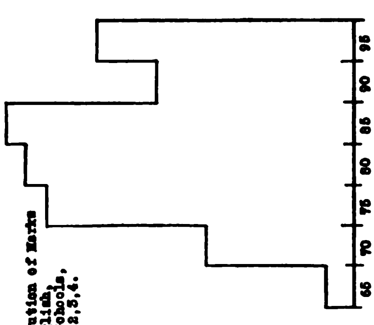
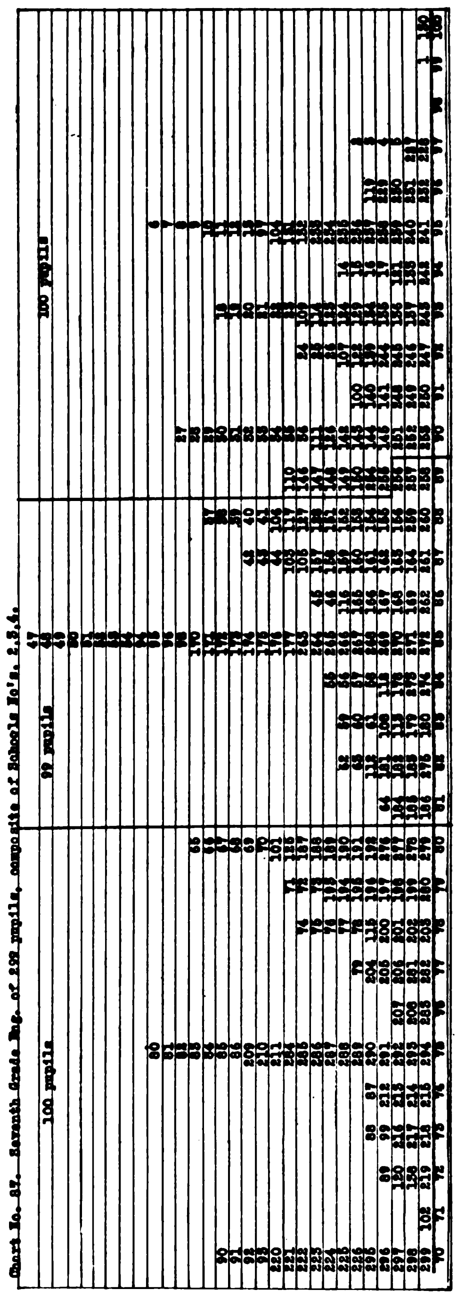


Chart No. 96. Fresh. English of the same 81 students, College No. 2.
68%
44%
51%
Chart No. 95. Soph. English of the same 81 students, High School No.5.
27 pupils
27 pupils
27 pupils
Chart No. 94. Fresh. Eng. of 81 students, College No. 2.
48%
22%
37%
Chart No. 93. Fresh. Eng., average of 2 semesters of 81 pupils, High School No. 5.
27 pupils
27 pupils
27 pupils





Distribution of Marks in English, High Schools, No's. 2,3,4.



SEC. IV. SOME COMPARISONS OF HIGH SCHOOLS AND COLLEGES

This section includes a comparison of the relative standing of pupils between high schools and colleges, together with some comparisons on the basis of absolute marks.[1]

The object of this section is to discover as nearly as possible what the actual existing relation is between high schools and colleges, and then farther along, on the basis of these results and those found in sec. V, attempt to determine about what should really be expected to be the extent of correlation between the secondary and higher institutions of learning.

The variety of the systems of grading used in the following schools concerned, here again, as before, so complicates the process of comparing schools that it is not possible to draw conclusions without allowing for some modification of statements relative to the results.[2]

A general tendency, previously noted, is obvious when we compare such graphs as 89, 91′, 101, 103, 105, 107, 109, or some of the smaller graphs representing the 23 different high schools in chart 109A or 117 in the advance section; namely, that the great majority of the distributions of high-school marks tend to skew toward the top of the scale. This may be partly accounted for by the fact that none of the records of eliminated students are included, but in spite of this explanation it may be in part due also to the use of a too-narrow range of estimates.

Taking up more in detail some of the graphs representing the distributions of marks, it may be noted that the skew in chart 89 is much more exaggerated in case of the Freshman year than it is in the average of three years of English of precisely these same pupils as shown in chart 91. But do not charts 90 or 92 indicate that the rating in chart 91 is probably more justifiable than that in 89, since the high-school Freshman

[1] Since a three-estimate basis of marking practically amounts to ranking students, a few schools were charted and compared on the basis of the original grouping rather than by dividing them into equal tertile groups. The width of the broken base lines in charts 101, 102, 103, 104, 105, 106 indicates as well as the graphs the upward-skewing tendency in the high school and college already pointed out in the discussion.

[2] College No. 1 uses marks, 1, 2, 3, to represent students' standings from high to low, and these stand respectively for 90–100, 80–90, 70–80 per cent. College No. 2 uses the percentage system, ranging from 70–100; college No. 3 uses the letters A, B, C.

High school No. 1 uses the number system, 1, 2, 3, indicating respectively 95–100, 85–95, 75–85 per cent. Other high schools, as, for example, No. 7, No. 6, No. 5, use numbers, letters, and the ordinary percentage system, respectively.

Distribution of Marks in Chart No. 64.

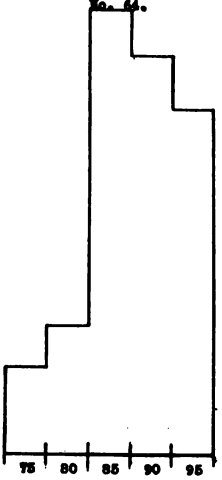


Chart No. 64. Eighth Grade Eng. of 338 pupils.

113 pupils				112 pupils				113 pupils			
			51%			43%				66%	
	287					148	116	84			
	288					149	117	85			
	289					150	118	86			
	290					151	119	87			
	291	260	233	206		152	120	88	56	28	
	292	261	234	207	180	153	121	89	57	29	1
	293	262	235	208	181	154	122	90	58	30	2
	294	263	236	209	182	155	123	91	59	31	3
	295	264	237	210	183	156	124	92	60	32	4
	296	265	238	211	184	157	125	93	61	33	5
318	297	266	239	212	185	158	126	94	62	34	6
319	298	267	240	213	186	159	127	95	63	35	7
320	299	268	241	214	187	160	128	96	64	36	8
321	300	269	242	215	188	161	129	97	65	37	9
322	301	270	243	216	189	162	130	98	66	38	10
323	302	271	244	217	190	163	131	99	67	39	11
324	303	272	245	218	191	164	132	100	68	40	12
325	304	273	246	219	192	165	133	101	69	41	13
326	305	274	247	220	193	166	134	102	70	42	14
327	306	275	248	221	194	167	135	103	71	43	15
328	307	276	249	222	195	168	136	104	72	44	16
329	308	277	250	223	196	169	137	105	73	45	17
330	309	278	251	224	197	170	138	106	74	46	18
331	310	279	252	225	198	171	139	107	75	47	19
332	311	280	253	226	199	172	140	108	76	48	20
333	312	281	254	227	200	173	141	109	77	49	21
334	313	282	255	228	201	174	142	110	78	50	22
335	314	283	256	229	202	175	143	111	79	51	23
336	315	284	257	230	203	176	144	112	80	52	24
337	316	285	258	231	204	177	145	113	81	53	25
338	317	286	259	232	205	178	146	114	82	54	26
	75	80		85		179	147	116	83	55	27
						90			95		

Distribution of Marks in Chart No. 65.

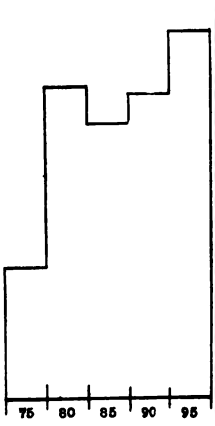


Chart No. 65. Average of Fresh.& Soph. Eng. of 338 pupils.

95*	58%			43%				66%			
118											
119									160	54*	
151									161	56*	1*
178									168	63*	2*
186									170	64*	4*
194	270-								171	67*	5*
206	276-	190	26*			177	86*		176	70*	6*
209	277-	196	33*			180	86*	5*	184	71*	7*
216	278-	197	45*	234-		187	87*	10*	191	74*	8*
263-	284-	200	59*	239-	125	189	92*	13*	195	76*	9*
265-	286-	203	60*	241-	127	192	94*	14*	196	82*	11*
266-	287-	210	78*	246-	129	201	96*	20*	199	86*	12*
274-	288-	211	79*	251-	131	202	104*	26*	204	89*	15*
279-	289-	214	113*	256-	132	205	105*	27*	212	90*	16*
291-	292-	219	114	257-	134	207	106*	28*	216	91*	17*
282-	296-	221	123	258-	135	213	108*	32*	218	97*	18*
283-	297-	223	137	267-	136	227-	116	34*	222	98*	19*
299-	304-	226	140	271-	149	230-	120	35*	224	99*	21*
300-	311-	232-	146	272-	155	231-	124	42*	226-	101*	23*
301-	313-	237-	150	273-	158	233-	126	44*	229-	107*	29*
303-	316-	240-	156	280-	164	236-	128	48*	235-	109*	30*
306-	318-	243-	157	293-	167	238-	133	49*	245-	111*	31*
312-	321-	244-	159	294-	173	242-	138	53*	248-	115*	36*
315-	322-	247-	163	306-	174	253-	143	55*	249-	116	38*
320-	329-	250-	165	307-	175	264-	144	66*	255-	130	39*
323-	330-	252-	166	309-	188	276-	148	66*	260-	139	40*
324-	331-	254-	179	314-	198	285-	152	68*	261-	141	41*
326-	333-	259-	181	317-	208	290-	154	75*	291-	142	43*
328-	335-	263-	182	319-	217	302-	162	77*	296-	145	47*
332-	336-	268-	183	325-	220	308-	169	83*	298-	147	50*
338	337-	269-	185	334-	228-	310-	172	84*	327-	153	51*
	75	80		85		90			95		

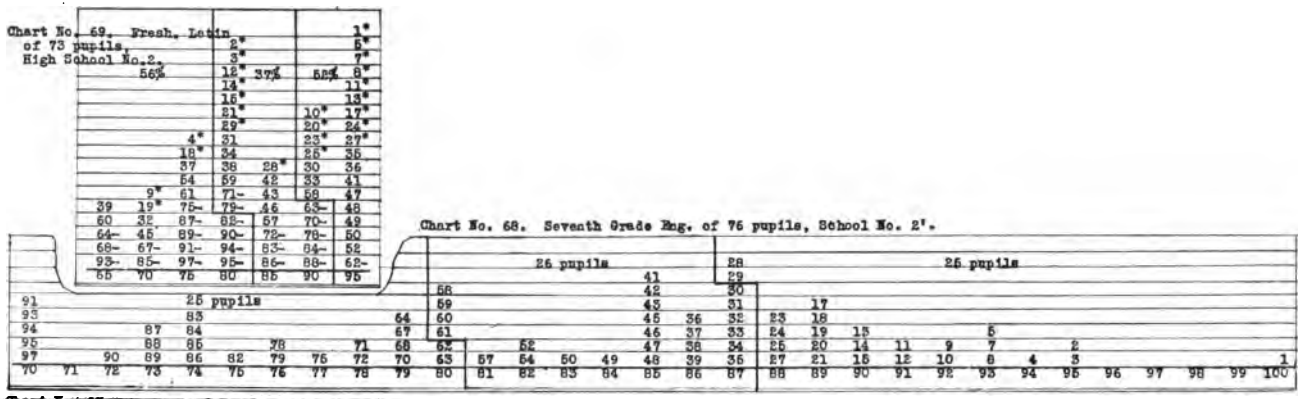


Chart No. 69. Fresh. Latin of 73 pupils, High School No. 2.
56%
37%
52%
Chart No. 68. Seventh Grade Eng. of 76 pupils, School No. 2'.
26 pupils
25 pupils
Chart No. 67. Average of Fresh. & Soph. Math of 97 pupils, High School No. 2.
46%
36%
62%
Chart No. 66. Seventh Grade Arith. of 97 pupils, School No. 2'.
32 pupils
33 pupils
32 pupils

Chart No. 71. Average of 2 semesters of Fresh. Eng. of 97 pupils, High School No. 2.

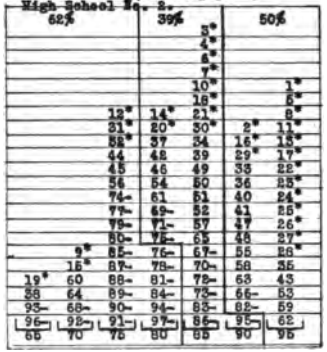


Chart No. 72. Average of Fresh.& Soph. Eng. of 97 pupils, High School No. 2.

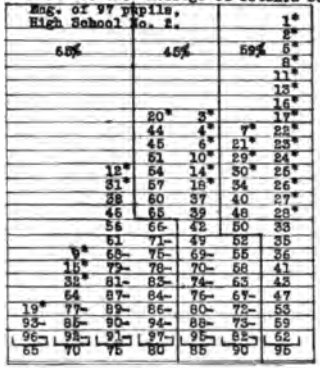
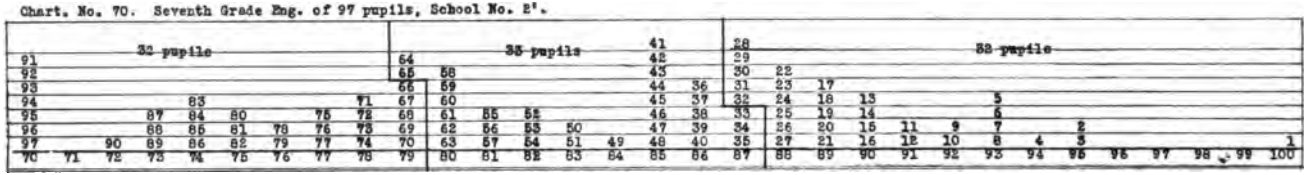


Chart. No. 70. Seventh Grade Eng. of 97 pupils, School No. 2'.



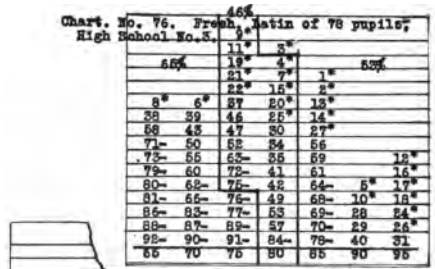


Chart. No. 76. Fresh. Latin of 78 pupils, High School No.3.
46%
66%
53%

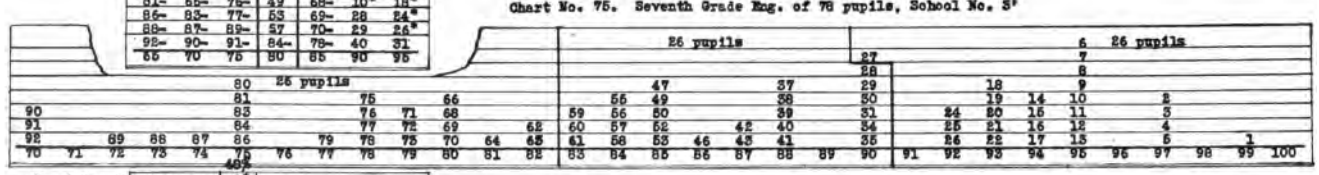


Chart No. 75. Seventh Grade Eng. of 78 pupils, School No. 3'
26 pupils
26 pupils
25 pupils

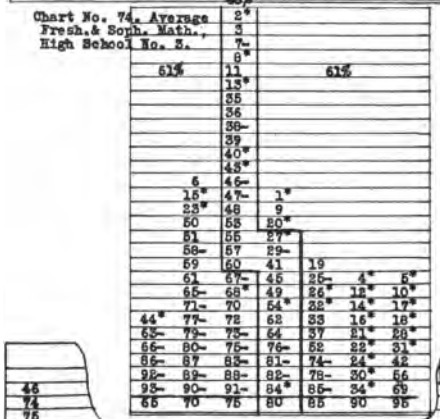


Chart No. 74. Average Fresh.& Soph. Math., High School No. 3.
46%
61%
61%

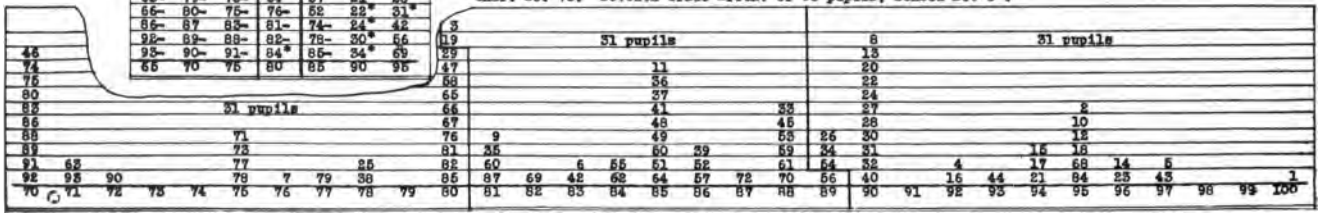


Chart No. 73. Seventh Grade Arith. of 93 pupils, School No. 3'.
31 pupils
31 pupils
31 pupils

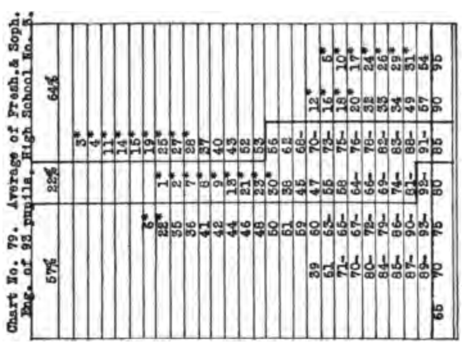


Chart No. 79. Average of Fresh. & Soph. Eng. of 93 pupils, High School No. 5.
57%
22%
64%

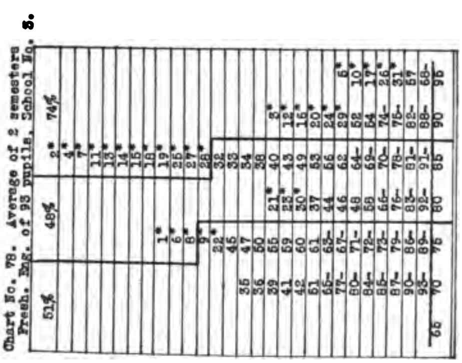


Chart No. 78. Average of 2 semesters Fresh. Eng. of 93 pupils, School No. 5.
51%
48%
74%

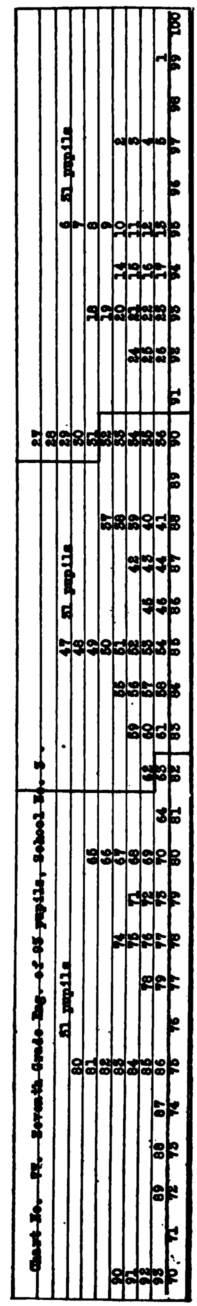


Chart No. 77. Seventh Grade Eng. of 93 pupils, School No. 5.
51 pupils
51 pupils
51 pupils

Chart No. 81. Average of 2 semesters Fresh. Eng. of 73 pupils, High School No.4.

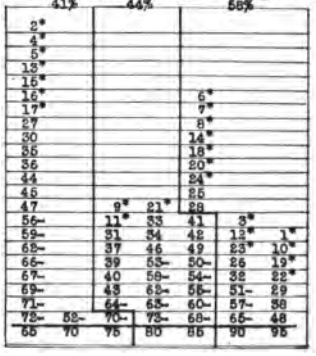


Chart No. 82. Average Fresh. & Soph. Eng. of 73 pupils, High School No.4.

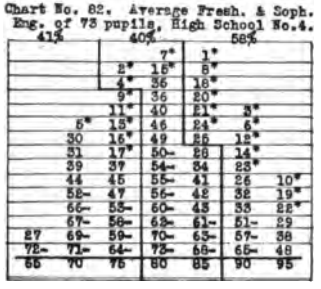


Chart No. 80. Seventh Grade Eng. of 73 pupils, School No. 4.

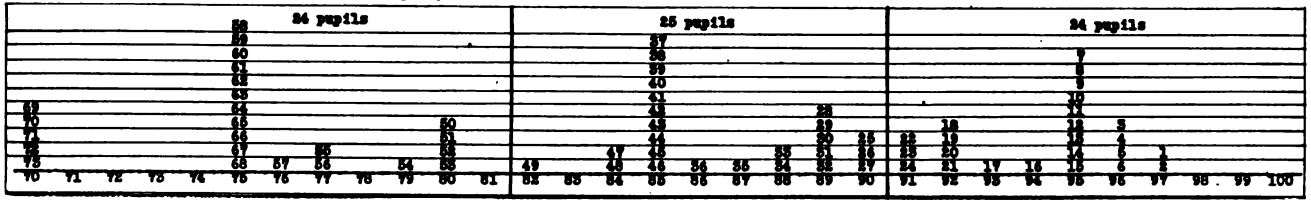
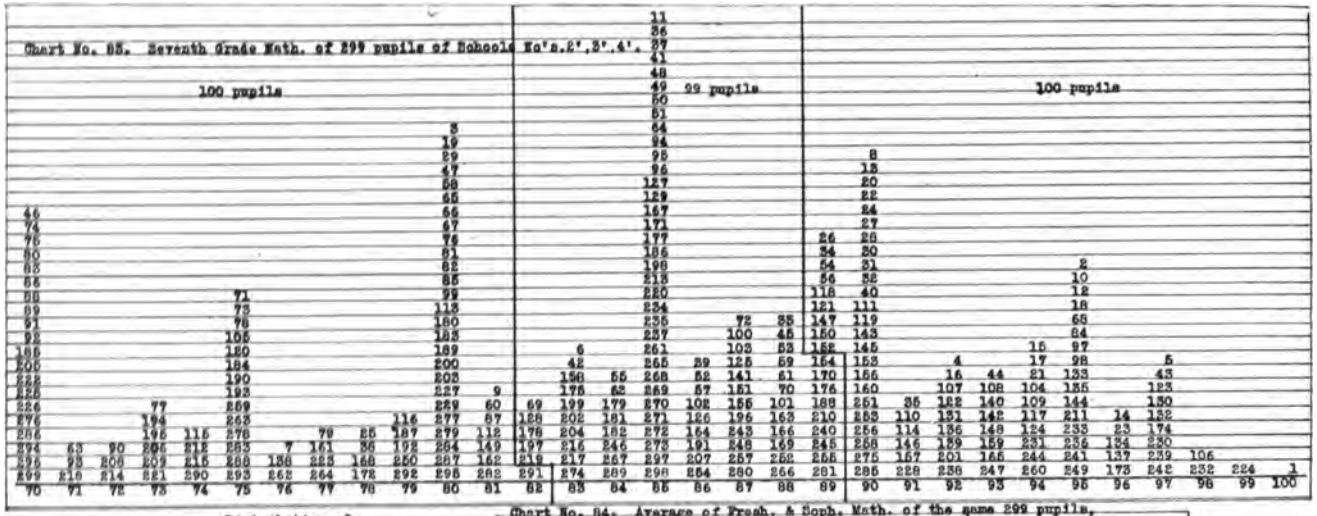


Chart No. 83. Seventh Grade Math. of 299 pupils of Schools No's.2',3',4'.



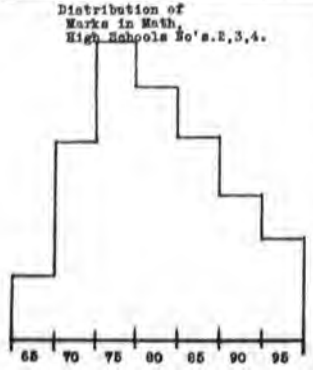
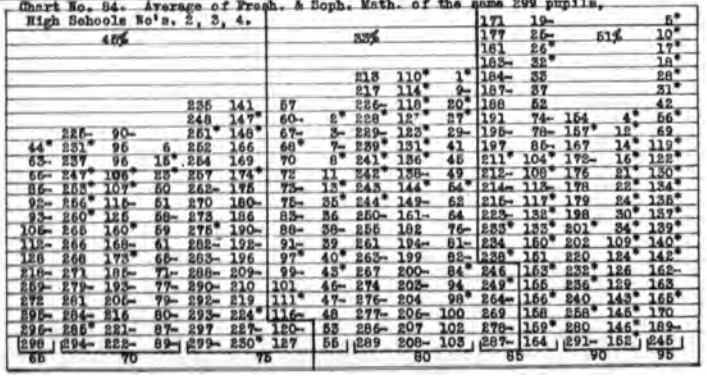


Chart No. 84. Average of Fresh. & Soph. Math. of the same 299 pupils.



Distribution of Marks in Latin, High Schools No's. 2, 3, 4.

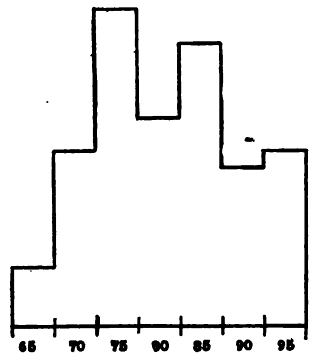


Chart No. 86. Average of Fresh. & Soph. Latin of the same 166 pupils, High Schools No's. 2, 3, 4.

				3*				
	496		325	15*		57	5	
				19*				
				30*				
				34*				
	6*			37				10*
	59			42				12*
	45	121*	8*	68-			5*	16*
	50	123*	21*	106			14*	18*
	52	158-	22*	127	105	1*	17*	24*
	55	144	35*	131*	111*	2*	28*	26*
	60-	160	41	132*	117	13*	29*	119*
	66-	166	46	153*	126*	20*	31*	122*
	72-	167	53	139*	129*	25*	109*	130*
	77-	185-	59-	141*	145*	27*	136*	134*
	89-	190-	61-	147	150	40	152	137*
	90-	208-	62-	175	154	49	153	140*
	112-	214-	63-	188-	156	56	156	142*
	116	215-	83-	199-	172	57	162	146
58	128	225-	87-	200-	187-	69-	181-	159
71-	161	226-	96	212-	192-	70-	201-	164
86-	174	228*	102-	220*	207-	76-	217-	165
197-	193-	230*	105	224-	236*	78-	238	177
222-	218-	251	107*	241*	252	84-	246*	179-
267	257	266	108-	277	264	91-	269	191-
271	288-	286-	110	282-	281-	101-	277-	258
65	70	75		80	85		90	95

Chart No. 85. Seventh Grade Eng. of 166 pupils in Schools No's. 2', 3', 4.

Group	Mark	Pupils (top to bottom)
55 pupils	70	90, 91, 222, 223, 224, 226
	71	102
	72	89, 138
	73	217, 218
	74	87, 212, 214, 215
	75	83, 84, 86, 286, 288
	76	207, 208
	77	281, 282
	78	76, 77, 78, 200, 201
	79	71, 72, 193, 197, 199
	80	66, 68, 69, 70, 101, 187, 188, 190, 191, 192, 277
	81	
	82	62, 63, 112, 181, 183
	83	59, 60, 61, 108, 179
56 pupils	84	55, 56, 57, 58
	85	49, 50, 52, 53, 96, 172, 174, 175, 177, 264, 266, 267, 271, 272
	86	46, 116, 165, 166, 167
	87	42, 45, 103, 105, 158, 159, 160, 161, 162, 164
	88	37, 39, 40, 42, 106, 117, 127, 128, 152, 153, 154, 156, 259
	89	110, 146, 147, 150, 257, 258
	90	144, 238, 251, 252
55 pupils	90	27, 28, 29, 30, 31, 34, 35, 111, 126, 142, 143
	91	140, 141, 220
	92	24, 25, 26, 107, 122, 139, 246
	93	18, 19, 20, 21, 22, 109, 123, 129, 134, 136, 137
	94	14, 15, 16, 17, 121, 133
	95	4, 8, 10, 12, 13, 131, 132, 236, 241
	96	119, 230
	97	2, 3, 5, 228
	98	
	99	1
	100	130

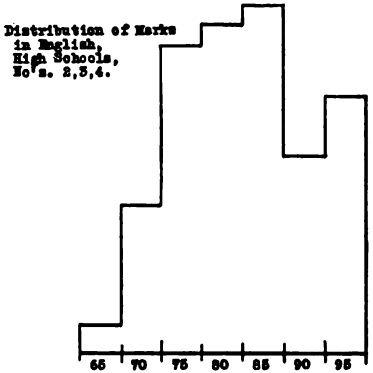


Chart No. 88. Average of Fresh.& Soph.Eng. of the same 299 pupils, High Schools No's 2,3,4

49%							28%				5%	50%				
									171	83-						
									176	83-	3*					
									190-	88-	4*					
							212-	94	1*	199-	91-	11*				
					90-	6*	213-	96	2*	203-	96	14*				
			216-	93-	22*		215-	100*	7*	205-	101-	16*	184	12*		
			219-	96	35*		225-	106*	8*	209-	102-	19*	187-	16*		
			219-	99-	36*		226-	107*	9*	217-	105	25*	193-	18*	164	131*
			220-	106	41		233*	111*	13*	224-	110	27*	196-	20*	165	134*
	193-		228*	112	42		241*	124*	21*	234*	115-	28*	201-	32*	169	137*
	206-	39	230*	113	44		261	129*	25*	244*	117	37	202-	33*	170	140*
	214-	61	236*	116	46		262	149*	30*	246*	118	40	211-	34*	172	142*
	221-	71-	237*	123*	48		266	173	38	247*	131*	43	229*	49	176	145*
	231*	77-	239*	128*	50		272	174	45	250*	126*	52	232*	57	182	146*
	256	80-	242*	141*	51		275	180	47	251*	127	53	236*	103	188-	151
	257	84-	243*	160	59		276-	183	55	254*	132*	56	240*	120-	191-	162
	266	85-	263	167	60		280-	186	58	260	133*	62	249*	136*	227*	163
	270	87-	271	175	63		281-	189-	64	267	155*	68	252*	150*	236*	164
146*	276-	89-	273	185	66-		282-	194-	66-	268	159*	70-	256	158	245*	166
232-	282-	125-	279-	190-	67-		286-	195-	69-	269	162*	73-	259	159	248*	166
256-	288-	130-	284-	197-	78-		288-	200-	74-	287-	147*	75-	277-	177	255*	167
258*	295-	144*	286-	208-	79-		296-	204-	81-	289-	166	76-	283-	179	264	168
290-	297-	161	290-	210-	86-		299-	207-	92-	294-	176	78-	291-	181	274	183
65	70		75				80			85		90		95		

Chart No. 87. Seventh Grade Eng. of 299 pupils, composits of Schools No's. 2,3,4.

100 pupils											99 pupils										100 pupils										
																	47														
																	48														
																	49														
																	50														
																	51														
																	52														
																	53														
																	54														
																	94														
						80											95												6		
						81											96												7		
						82											98				27								8		
						83				55							170				28								9		
						84				56							171			57	29								10		
90						85				67							172			86	30				18				11		
91						86				68							173			39	31				19				12		
92						209				69							174		42	40	32				20				13		
93						210				70							175		43	41	33				21				97		
220						211				101							176		44	106	34				22				104		
221						264			71	126							177		103	117	35				23				131		
222						265			74	72	167						263		105	127	146	36		24	109				132		
223						266			75	73	186						264	45	157	128	147	111		25	114				235		
224						267			76	195	189					55	265	46	158	161	148	126		26	123				254		
225						268			77	194	190			62	59	56	266	116	159	162	149	142		107	124	14	235				
226						269		72	78	195	191			63	60	57	267	165	160	168	150	143	100	122	129	15	236				
296				88	87	290		204	115	196	192			112	61	58	268	166	161	154	254	144	140	139	154	16	237	119	3		
296		89		99	218	291		205	200	197	276		64	181	106	118	269	167	162	155	255	145	141	244	155	17	238	229	4		
297		120		216	215	292	207	206	201	198	277		184	182	113	176	270	168	163	166	256	251	248	245	156	181	239	250	5		
298		156		217	214	293	208	281	202	199	278		185	183	179	178	271	169	164	269	257	252	249	246	157	183	240	251	227		
299	102	219	216	216	294	283	282	203	280	279		186	276	180	274		272	262	261	260	258	253	250	247	243	242	241	252	228		1	150
70	71	72	73	74	75	76	77	78	79	80		81	82	83	84		85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

SEC. IV. SOME COMPARISONS OF HIGH SCHOOLS AND COLLEGES

This section includes a comparison of the relative standing of pupils between high schools and colleges, together with some comparisons on the basis of absolute marks.[1]

The object of this section is to discover as nearly as possible what the actual existing relation is between high schools and colleges, and then farther along, on the basis of these results and those found in sec. V, attempt to determine about what should really be expected to be the extent of correlation between the secondary and higher institutions of learning.

The variety of the systems of grading used in the following schools concerned, here again, as before, so complicates the process of comparing schools that it is not possible to draw conclusions without allowing for some modification of statements relative to the results.[2]

A general tendency, previously noted, is obvious when we compare such graphs as 89, 91′, 101, 103, 105, 107, 109, or some of the smaller graphs representing the 23 different high schools in chart 109A or 117 in the advance section; namely, that the great majority of the distributions of high-school marks tend to skew toward the top of the scale. This may be partly accounted for by the fact that none of the records of eliminated students are included, but in spite of this explanation it may be in part due also to the use of a too-narrow range of estimates.

Taking up more in detail some of the graphs representing the distributions of marks, it may be noted that the skew in chart 89 is much more exaggerated in case of the Freshman year than it is in the average of three years of English of precisely these same pupils as shown in chart 91. But do not charts 90 or 92 indicate that the rating in chart 91 is probably more justifiable than that in 89, since the high-school Freshman

[1] Since a three-estimate basis of marking practically amounts to ranking students, a few schools were charted and compared on the basis of the original grouping rather than by dividing them into equal tertile groups. The width of the broken base lines in charts 101, 102, 103, 104, 105, 106 indicates as well as the graphs the upward-skewing tendency in the high school and college already pointed out in the discussion.

[2] College No. 1 uses marks, 1, 2, 3, to represent students' standings from high to low, and these stand respectively for 90–100, 80–90, 70–80 per cent. College No. 2 uses the percentage system, ranging from 70–100; college No. 3 uses the letters A, B, C.

High school No. 1 uses the number system, 1, 2, 3, indicating respectively 95–100, 85–95, 75–85 per cent. Other high schools, as, for example, No. 7, No. 6, No. 5, use numbers, letters, and the ordinary percentage system, respectively.

class as a group does not hold its position in the Freshman year of college? And furthermore, the 86 pupils out of these 266 represented in chart 91′ who go on to college and graduate, as a group, hold their place pretty well, as shown in the graph for chart 92′.

The 81 pupils who go on to college No. 2, represented in charts 93, 95, and 97, are taken from the previous group of 212 pupils in school No. 5. Numerous marks toward the lower end of the scale here occur, as was previously the case, with the whole group. When chart 99, representing Freshman-Sophomore mathematics, is compared with the above charts, it indicates that the standards are somewhat different in the two departments.

Again, the shifting of the whole group of pupils in college mathematics toward the lower end of the scale, as shown in chart 100, indicates that the two institutions are not using similar standards. For in chart 99 the pupils are grouped about the upper end of the scale. Charts 84, 96, or 98 indicate a sort of bimodal distribution, with a somewhat larger number of marks toward the top of the scale, while in chart 100 marks are more numerous toward the lower end. Consequently the departments within college No. 2 are using different standards, although these are more alike than those used by the high school and college.

Graphs 101–9 indicate on the whole that either the standards of the two institutions are not similar or that the students who go from the high schools are not strong enough to maintain, as a group, their positions. Whenever there has been any considerable number of pupils involved in these comparisons, in very few instances do the graphs show a normal distribution of high-school pupils, examples of which, not before used, are charts 101, 103, 105, 107, indicating absolute marks; while on the other hand college No. 1, as evidenced by graphs 102, 104, 106, 108, has in the majority of cases distributed its marks somewhat according to the normal curve.

A very brief discussion of some of the charts representing the 23 different high schools, together with composite charts of these same pupils, will furnish some notion of the relation of these schools to college No. 1. See charts 107–9A.

After finding out the standing of these pupils in terms of percentage, they were translated into terms of 1, 2, 3, and then charted and graphed, separately, in the first instance, as well as charted and graphed in composite form later.[1]

[1] The percentage system is used in practically all of these high schools. Since college No. 1 uses the marks 1, 2, 3, it was thought that it would be interesting to find

Schools Nos. 22, 25, and 5 are exceptions to the skew upward.[1] While schools Nos. 5 and 22 hold their positions in the college or probably improve as a group, school No. 25 as a group does not do so well in maintaining its relative position. School No. 21 has a peculiar rectangular distribution which is hardly possible with any large number of pupils, but this group, too, improves as a whole in the college. The different relations between the standings of the high-school pupils in schools Nos. 35 and 18, and in college No. 1, either show a difference in the use of standards by the college, or it shows that high school No. 25 is the weaker of the two.

It might be concluded from the graphs in chart 109A that in such schools as Nos. 12, 23, 14, 15, 17, 20, 8, 24, 27 only the stronger pupils enter college, if it were not for the distribution of marks which occurs during the Freshman year of college work. It may be noted that the groups as a whole shift toward the lower end of the scale in college No. 1.

The actual percentage ratings were charted in chart 109 to indicate that the translation of the percentages to 1, 2, 3 did not distort in any way the grouping of the marks. For chart 107 shows the same tendency through its graph to skew toward the top as is found in chart 109. And while there are exceptions to this tendency, found in the separate graphs of the 23 schools, yet the composite charts 107 and 108 warrant the statement that there is a more normal distribution of grades in college No. 1 than in the 23 high schools considered as a whole.[2] As has been said relative to previous charts, so here it may be reiterated that it is possible to determine what the relative standing of individuals is, as well as of the group, by following out the numbers accompanied by the characters plus and minus. For illustration, in high school No. 11 out of the 15 pupils who had a standing of 1 in the high school, 6 retained this standing in the college, 7 of them

out from all the principals concerned precisely what is the range of the scale used in the various high schools, and exactly what percentages which they do use are equal to the 1, 2, 3 marks of the college.

From this investigation it was learned that the large majority of the high schools are using a range of 70–100 per cent, in which 1 equals 90–100; 2, 80–90; 3, 70–80. In the other several schools 1 equals 90–100; 2, 80–90; 3, 75–80; or 1 equals 90–95; 2, 85–90; 3, 80–85; or 1 equals 95–100; 2, 85–95; 3, 75–85; or A+ equals 97–100; A, 90–97; B+, 85–90; B, 80–85; C, 70–80.

[1] The 23 high schools do not appear in any logical order because it was necessary to rearrange the charts for the purpose of printing them.

[2] Charts 107 and 108 have been used in finding the retention between the composite 23 high schools and college No. 1.

tertile, a retention of 5, and columns 1, 2, and 3 in the lower tertile, a retention of 16 pupils throughout the three institutions.

8th Grade Eng.

	H.S.No.6 Ch.129,130 Aver.4 yrs.Eng.			
	1	2	3	Ter. Ret.
1	15	15	0	50.00
2	8	12	10	40.00
3	7	3	20	66.66
	Tot.Ret.			52.22

4 yrs.Aver.

	Col.No.3 Ch.130,131 Fr.Eng.			
	1	2	3	Ter. Ret.
1	14	11	5	46.66
2	14	12	4	40.00
3	2	7	21	20.00
	Tot.Ret.			52.20

8th Grade Math.

	H.S.No.6 Ch.132,133 Fr.Math.			
	1	2	3	Ter. Ret.
1	15	8	2	60.00
2	8	6	10	25.00
3	2	10	13	52.00
	Tot.Ret.			45.94

Fr. H. S. Math.

	Col.No.3 Ch.133,134 Fr.Math.			
	1	2	3	Ter. Ret.
1	15	7	3	60.00
2	8	7	9	29.16
3	2	10	13	52.00
	Tot.Ret.			47.29

6,7,8 Gr.Eng.

	H.S.No.6 Ch.135,136 Aver.of Fresh. & Soph.Math.			
	1	2	3	Ter. Ret.
1	8	10	1	42.10
2	8	4	8	20.00
3	3	6	10	52.63
	Tot.Ret.			37.24

Fr. Soph. H.S.

	Col.No.3 Ch.136,137 Fr.Math.			
	1	2	3	Ter. Ret.
1	12	6	1	63.15
2	7	4	9	20.00
3	0	10	9	47.36
	Tot.Ret.			43.10

8th Grade Hist.

	H.S.No.6 Ch.138,139 Soph.Hist.			
	1	2	3	Ter. Ret.
1	13	5	3	61.90
2	5	11	5	52.38
3	4	4	13	61.90
	Tot.Ret.			58.73

So. Hist.

	Col.No.3 Ch.139,140 Fr.Hist.			
	1	2	3	Ter. Ret.
1	12	5	4	57.14
2	4	13	4	61.90
3	5	3	13	61.90
	Tot.Ret.			60.31

TABLE XII

Showing retention in grammar school No. 6', high school No. 6, and college No. 2.

Pupils	Low Tertile		
63	3	3	3
66	3	3	3
72	3	3	3
74	3	3	3
75	3	3	3
76	3	3	3
78	3	3	3
80	3	3	3
82	3	3	3
83	3	3	3
84	3	3	3
85	3	3	3
87	3	3	3
88	3	3	3
89	3	3	3
90	3	3	3
64	3	3	2
65	3	3	2
67	3	3	2
86	3	3	1
71	3	2	3
77	3	2	3
61	3	1	2
66	3	1	2
69	3	1	2
62	3	2	1
70	3	1	3
73	3	1	3
79	3	1	3
81	3	1	3

Pupils	Mid.Tertile		
34	2	2	2
37	2	2	2
39	2	2	2
44	2	2	2
45	2	2	2
33	2	2	1
36	2	2	1
41	2	2	1
43	2	2	1
51	2	2	1
32	2	2	3
47	2	2	3
31	2	1	1
46	2	1	1
56	2	1	1
48	2	1	2
50	2	1	2
53	2	1	2
59	2	1	2
38	2	3	2
49	2	3	2
52	2	3	2
60	2	3	2
35	2	3	3
40	2	3	3
42	2	3	3
55	2	3	3
57	2	3	3
54	2	1	3
58	2	3	1

Pupils	High Tertile		
2	1	1	1
3	1	1	1
4	1	1	1
5	1	1	1
6	1	1	1
7	1	1	1
14	1	1	1
21	1	1	1
22	1	1	1
23	1	1	1
24	1	1	1
10	1	1	2
13	1	1	2
15	1	1	2
20	1	1	2
1	1	2	1
8	1	2	1
12	1	2	1
16	1	2	1
19	1	2	1
26	1	2	1
29	1	2	1
30	1	2	1
9	1	2	1
11	1	2	2
17	1	2	2
18	1	2	2
25	1	2	2
27	1	2	2
28	1	2	2

TABLE D

Showing relative standing of each pupil in grammar school No. 6', high school No. 6. and college No. 6, of 90 pupils.

Diagram V and table D show that no pupils in passing from the high third of the grammar school fall to the lower third in the high school and then pass back to the high third in college; but number 62, for

is 53.08 per cent between the Sophomore high-school English, and Freshman college English; the total retention between Freshman high-school and Freshman college English is low, namely, 35.80 per cent; while that between the four years' average and the Freshman college English is 45.67 per cent.

On the basis of the single subjects compared, the results warrant the conclusion that the correlation between the high school and college is better for high school No. 1 and college No. 1 than it is for high school No. 5 and college No. 2.

The amount of retention for the schools compared on the basis of absolute marks is somewhat similar to that of the comparisons on the basis of the relative standing, as shown in table IX. The total retention for English between high school No. 7 and college No. 1 is 53.57

Fr. Eng. H. S. No. 7	Col. No. 1				
	Fr. Eng Ch. 101, 102.				
		I	II	III	Div. Ret.
	1	26	23	3	50.00
	2	4	15	5	62.50
	3	2	2	4	50.00
Fr.	Tot. Ret				53.57

Math. H. S. No. 6	Col. No. 3				
Fr.	Fr. Col. Math Ch. 103, 104.				
		A	B	C	Div. Ret.
	E	52	28	17	53.60
	G	11	48	11	68.57
	F	2	4	11	64.69
	Tot. Ret.				60.32

Eng. H. S. No. 6	Col. No. 3				
Fr.	Fr Eng Ch. 105, 106.				
		A	B	C	Div. Ret
	E	41	45	15	40.98
	G	6	24	19	48.97
	F	2	7	6	40.00
	Tot Ret				43.00

TABLE IX

Showing retention between high school and college on basis of absolute marks.

per cent. This is higher than is the retention for English between high school No. 6 and college No. 3, which was found to be 43 per cent. The high retention of 60.32 per cent in mathematics for school No. 6 may be due to the fact that these pupils have been a select body with a special interest in mathematics. It may be due to the fact that the standards of the two colleges are different.

Composite charts 107 and 108 represent pupils from 23 different high schools, who go on to college. The total retention in the subjects of English on the basis of absolute marks is 53.30 per cent.[1] The exact retention for high school No. 1 and college No. 1 between Freshman high-school English and Freshman college English is 77.52 per cent; between the three years' average of high-school English and the Freshman college English, 88.76; between the three years' average of high school and the four years' average of college English, 87.93;

[1] The exact retention for each division is as follows: 45.91 per cent for division I; 28.57 for division II; and 71.73 for division III. Retention here is based upon the number of pupils in the original groups respectively.

example, passes from the lower group of the grammar school to the middle group in the high school and to the high group in the college, and numbers 70, 73, 79, 81 go from the low group in the grammar school to the high group in high school and back to the low group in college. As previously stated, it is important not only to know in what respective groups pupils appear in college, but it is equally important to know over what path, circuitous or straight, they have come.

Table D and diagram V show that there is a larger proportionate retention than was the case in table B and diagram III, but that there is a smaller proportionate retention than was the case in table C and diagram IV. Consequently the result is that according to this diagrammatic scheme the retention of pupils throughout the three institu-

8th Gr. Eng.	H. S. No. 6 Charts 141, 142. Av. 4 yrs. Eng.				Av. 4 yrs. Eng.	Col. No. 1 Charts 142,143 Fr. Eng.				8th Gr. Eng.	H. S. No. 6 Charts 141,144 Fr. Eng.				8th Gr. Eng.	Col. No. 1 Charts 144,145 Fr. Eng.			
	1	2	3	Ter. Ret.		1	2	3	Ter. Ret.		1	2	3	Ter. Ret.		1	2	3	Ter. Ret.
1	8	3	1	66.66		7	3	2	58.33		6	5	1	50.00		7	3	2	58.33
2	3	5	3	45.45		3	7	1	63.63		5	3	3	27.27		2	7	2	63.63
3	1	3	8	66.66		2	1	9	75.00		1	3	8	66.66		3	1	8	66.66
	Tot. Ret.			60.00		Tot.Ret.			65.71		Tot.Ret.			48.57		Tot.Ret.			62.86
8th Gr. Eng.	H. S. No. 6 Charts 141, 146. Gen. Eng.				Gen. Eng.	Col. No. 1 Charts 146,147 Fr. Eng.				8th Gr. Arith.	H. S. No. 6 Charts 148,149 Fr. Math.				Fr. Math.	Col. No. 1 Charts 149,150 Fr. Math.			
	1	2	3	Ter. Ret.		1	2	3	Ter. Ret.		1	2	3	Ter. Ret.		1	2	3	Ter. Ret.
1	9	3	0	75.00		7	4	1	58.33		5	2	0	71.42		5	2	0	71.42
2	2	7	2	63.63		3	5	3	45.45		1	2	3	33.33		2	3	1	50.00
3	1	1	10	83.33		2	2	8	66.66		1	2	4	57.14		0	1	6	85.71
	Tot. Ret.			74.28		Tot.Ret.			57.14		Tot?Ret.			55.00		Tot.Ret.			70.00

TABLE XIII

Showing retention in grammar school No. 6′, high school No. 6, and college No. 1.

tions is highest in the case of grammar school No. 1′, high school No. 1, land college No. 1.

On the whole, it is obvious that the percentages of retention are ower than in table XI. With the exception of the relation between charts 129 and 130 the retention is higher between the high school and college than it is between the grammar school and high school, as indicated by table XII, which is exactly the reverse of the results shown in table XI. The retention for both the grammar school and high school and for the high school and college is not far from 50 per cent.

The number of pupils involved in the comparison summarized in tables XII and XIII are too few to make anything but tentative conclusions. But on the whole, the percentages of retention between

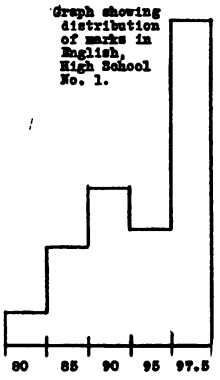


Chart No.89. Average of 2 semesters in English of 266 pupils, High School No. 1.

89 pupils.					88 pupils.				89 pupils.				
						121	24						
						130	51	180	160	65	45	20	
			219	134	25	141	54	181	161	66	46	21	1
	140	61	220	143	42	203	55	182	162	69	47	22	2
	142	66	221	144	72	204	57	183	163	90	48	23	3
	147	68	222	145	73	205	62	184	164	91	49	26	4
	149	71	227	146	77	206	70	185	165	94	50	27	5
	153	74	229	148	83	211	76	186	166	97	51	28	6
	154	76	230	198	88	212	79	187	167	108	52	29	7
41	156	80	234	199	92	215	81	188	168	110	53	30	8
120	251	93	237	200	95	223	84	189	169	116	56	32	9
124	252	109	239	201	96	224	87	190	170	119	58	33	10
133	254	111	240	202	99	225	98	191	171	125	59	34	11
161	255	113	242	207	100	226	101	192	172	126	60	35	12
167	256	118	244	209	104	228	102	193	173	128	65	36	13
206	257	122	245	210	112	231	105	194	174	132	64	37	14
253	259	135	246	213	117	232	106	195	175	150	65	38	15
258	260	136	247	214	123	233	107	196	176	152	67	39	16
262	261	137	248	216	127	235	108	197	177	155	69	40	17
266	263	138	249	217	129	236	114	238	178	158	75	43	18
266	264	139	250	218	131	241	116	243	179	159	82	44	19
80	85		90			93				97.5			

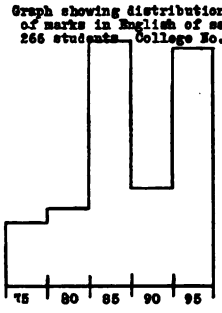


Chart No. 90. Fresh. English of the same 266 students, College No. 1.

61%						31%				86%				
				230-	162*	112	80-	24	128*	3*	187	145-		
				232	166*	113-	83	25	135-	18*	188	146-	89*	22* 1*
				233	167*	114	84	27*	148-	20*	189	162*	62	26* 2*
		200-		234-	172	116	86*	35*	154-	21*	190	167-	63*	28* 4*
		203	56-	235	173	115*	87	37*	180	23*	192	189*	77	29* 5*
		208	67*	236	176	120-	88	38*	186	33*	193	160*	79	30* 6*
136-	41-	211	68-	241	178	121	89*	39*	194	34*	195	163*	82*	31 7*
139-	71-	218-	70	246-	181	122-	91*	42	205	43*	196	164*	90*	32* 8*
149-	76	220-	78-	248-	185	123	92	46*	212	48*	197	165*	101	36* 9*
156-	96	222-	100	250-	191	125*	94*	58*	225	49*	201-	168*	108	40* 10*
198-	99	223	108	251-	199-	134-	96	60*	226	50*	208-	169*	105	44* 11*
206-	117	229-	137-	253-	209-	136-	97*	61-	237-	54	204	170	110*	45* 12*
217-	124-	230	142-	254-	210-	145-	98	66*	239-	57	209-	174	118-	47* 13*
219-	127-	242-	144-	256-	212-	150*	104	69*	240-	64*	216-	176	119*	51* 14*
227-	129-	245-	147-	263-	214-	181-	106	72	243	81	228	179	125*	62* 15*
252-	130	256-	156*	264-	215	152-	107	75	247-	86*	231	182	132*	63* 16*
258-	131-	259-	171	265-	221-	155*	109-	94-	249-	93-	244-	185	140-	85 17*
261-	133-	260-	177	266-	224	161*	111-	76*	257-	103*	262-	184	141	86* 19*
75		80				85			90			95		

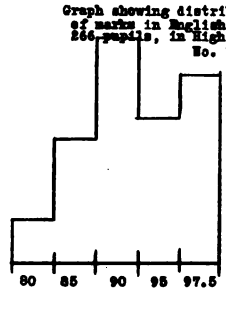


Chart No. 91. Average of 3 years in English for each of the 266 pupils, High School No. 1.

89 pupils				88 pupils				89 pupils			
149								162	36	1	
153	61							166	37	2	
154	68	210		143				159	38	3	
156	71	211		145	101	25		161	39	4	
206	74	218		146	106	42		164	40	5	
213	77	217		147	106	55	182	62	20	165	43 6
214	78	220		148	107	57	184	65	21	166	44 7
41	218	80	221	157	108	60	191	67	22	167	45 8
72	219	83	227	168	114	64	204	75	24	168	47 9
111	222	88	230	172	116	66	205	79	26	169	48 10
113	223	95	234	173	117	70	209	81	28	170	50 11
122	224	99	235	177	118	73	216	102	29	183	52 12
124	229	100	236	180	121	76	216	115	30	185	53 13
133	245	104	237	181	123	84	225	150	31	187	63 14
139	250	109	239	186	125	86	226	160	33	188	69 15
142	251	112	240	198	126	87	228	162	34	189	82 16
151	253	120	241	199	129	89	231	163	46	190	85 17
252	254	127	242	200	130	91	232	171	54	192	90 18
258	255	136	244	201	131	92	233	174	61	193	97 19
259	256	137	246	202	132	93	238	176	49	194	103 22
261	257	138	248	203	134	94	242	176	56	195	110 27
266	260	140	262	207	135	96	247	178	58	196	119 32
266	264	144	263	208	141	98	249	179	59	197	128 35
80	85			90				98		97.5	

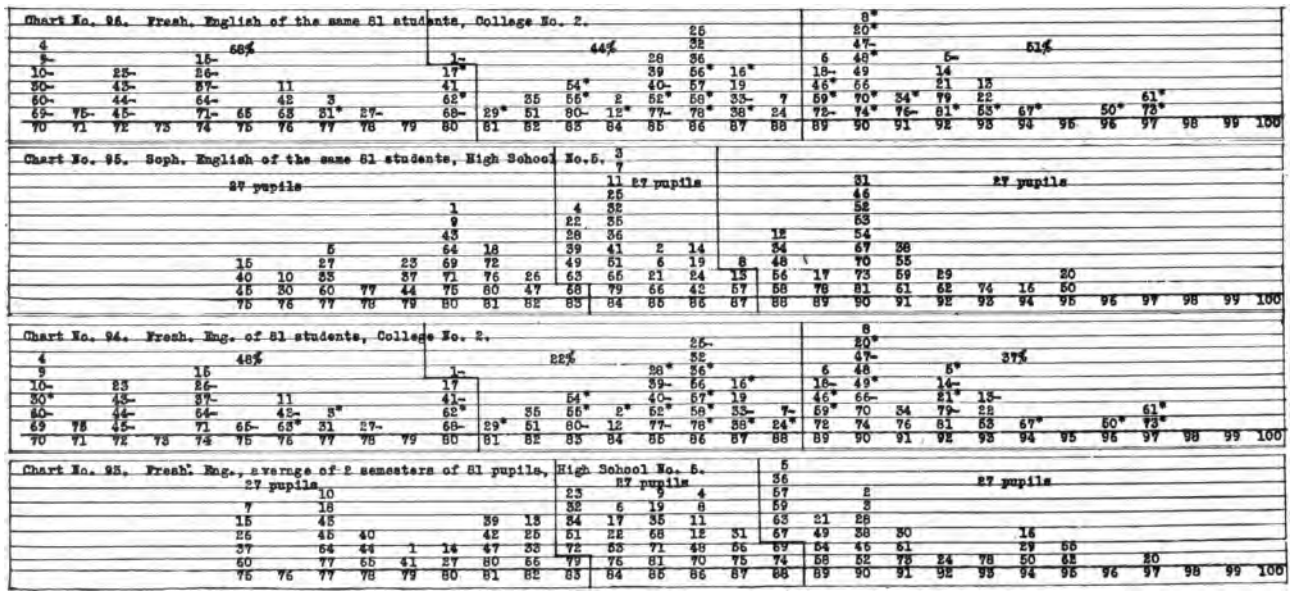


Chart No. 96. Fresh. English of the same 81 students, College No. 2.
68%
44%
51%
Chart No. 95. Soph. English of the same 81 students, High School No. 5.
27 pupils
11 27 pupils
27 pupils
Chart No. 94. Fresh. Eng. of 81 students, College No. 2.
46%
22%
37%
Chart No. 93. Fresh. Eng., average of 2 semesters of 81 pupils, High School No. 5.
27 pupils
27 pupils

Chart No. 101. Fresh. Eng. of 84 pupils, High School No. 7.

	8	1
	9	4
49	29	5
50	30	6
54	31	7
55	32	8
56	33	9
57	34	10
58	35	11
59	36	12
60	37	13
61	38	14
63	39	15
65	40	16
66	41	17
67	42	18
68	43	19
69	44	20
70	45	21
71	46	22
72	47	23
73	48	24
74	51	25
75	52	26
76	53	27
77	64	28
3	2	1

Distribution of Marks in Chart No. 101.

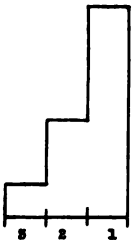
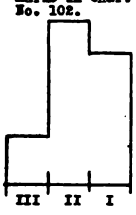


Chart No. 102. Fresh. Eng. of the same 84 pupils, College No. 1.

	47*	18*		
	49	46*		
	50	20*		
	51*	21*		
	53*	22*	2*	1*
	56	23*	4*	3*
	58	26*	6*	5*
	59	27*	8*	7*
24*	60	28*	35*	9*
26*	61	29*	36*	10*
52*	65	30*	38*	11*
57	68	31*	39*	12*
62-	69	32*	48*	13*
66	71	37*	54	14*
67	74	40*	55	16*
70	75	41*	63	17*
73	76	42*	64*	18*
82-	77	43*	72	19*
83-	79-	44*	78-	33*
84-	81-	45*	80-	34*
III	II		I	

Distribution of Marks in Chart No. 102.



Distribution of Marks in Chart No. 103.

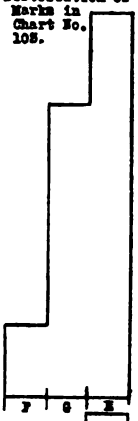


Chart No. 103. Fresh. Math. of 184 pupils. High School No. 6.

	143	118		75	49	23	
	144	119		76	50	24	
	146	120		77	51	25	
	146	121		78	52	26	1
	147	122		79	53	27	2
	148	123	41	80	54	28	3
	149	124	55	81	56	29	4
	150	125	100	82	57	30	5
168	151	126	101	83	58	31	6
169	152	127	102	84	59	32	7
170	153	128	103	85	60	33	8
171	154	129	104	86	61	34	9
172	155	130	105	87	62	35	10
173	156	131	106	88	63	36	11
174	157	132	107	89	64	37	12
175	158	133	108	90	65	38	13
176	159	134	109	91	66	39	14
177	160	135	110	92	67	40	15
178	161	136	111	93	68	42	16
179	162	137	112	94	69	43	17
180	163	138	113	95	70	44	18
181	164	139	114	96	71	45	19
182	165	140	115	97	72	46	20
183	166	141	116	98	73	47	21
184	167	142	117	99	74	48	22
F	G			E			

Distribution of Marks in Chart No. 104.

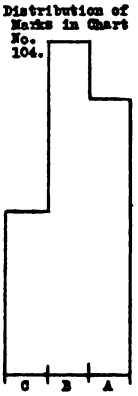


Chart No. 104. Fresh. Math. of the same 184 pupils, College No. 3.

			7*	4*			
		10*	13*	14*			
	72*	70*	126	15*	81*	31*	
	77*	73*	130	25*	86*	32*	
	82*	82*	132	37*	87*	33*	
	86*	84*	133	38*	89*	35*	
	93*	88*	134	39*	90*	36*	
	102	94*	136	44*	91*	40*	
	104	103	140	45*	92*	42*	
	109	105	141	46*	95*	43*	
	153	110	142	48*	96*	49*	
	154	111	145	53*	98*	50*	1*
	158	112	147	54*	99*	51*	3*
2*	159	113	148	57*	101	52*	5*
8*	162	114	150	62*	108	58*	6*
9*	163	115	152	65*	123	59*	16*
11*	170-	118	155	69*	131	60*	17*
12*	171-	120	160	78*	136	61*	18*
20*	174-	122	161	97*	137	63*	19*
24*	175-	126	164	100	143	64*	21*
34*	176-	127	165	106	144	66*	22*
41	177-	128	166	107	146	71*	23*
47*	179-	129	167	116	151	74*	26*
55	180-	138	169-	117	156	75*	27*
56*	182-	139	172-	119	157	76*	28*
67*	183-	149	173-	121	168-	79*	29*
68*	184-	153	181-	124	178-	80*	30*
C			B			A	

Distribution of Marks in Chart No. 105.

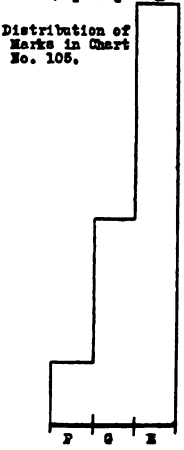


Chart No. 105. Fresh. Eng. of 165 pupils, High School No. 6.

			77				
	124		78	52	26	1	
	125	87	79	53	28	2	
	126	91	80	54	29	3	
	127	82	86	55	30	4	
	128	83	87	56	31	5	
	129	84	88	57	32	6	
	130	85	91	58	33	7	
	131	89	92	59	34	8	
	133	90	93	60	35	9	
	134	94	95	61	36	10	
119	135	96	98	62	37	11	
140	136	97	100	63	38	12	
141	137	99	101	64	39	13	
144	138	102	103	65	40	14	
156	139	107	104	66	41	15	
156	142	109	105	67	42	16	
157	146	110	106	68	43	17	
158	147	111	108	69	44	18	
159	148	112	113	70	45	19	
160	149	114	115	71	46	20	
161	150	117	116	72	47	21	
162	151	118	121	73	48	22	
163	152	120	132	74	49	23	
164	153	122	143	75	50	24	
165	154	123	145	76	51	25	
F	G			E			

Distribution of Marks in Chart No. 106.

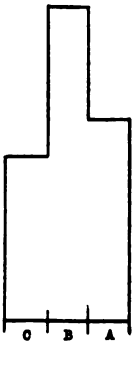


Chart No. 106. Fresh. Eng. of the same 165 pupils, College No. 3.

				22*			
		118	70*	23*	30*		
		120	71*	24*	31*	1*	
		121*	72*	25*	32*	2*	
		123	73*	26*	33*	3*	
		125	74*	35*	34*	4*	
112	50*	128	75*	37*	36*	5*	
114	56*	129	81	38*	39*	6*	
124	57*	133	82	41*	40*	7*	
126	62*	134	84	42*	44*	8*	
127	63*	138	87	43*	47*	9*	
130	68*	140-	88*	45*	49*	10*	
131	76*	141-	91*	46*	52*	11*	
135	77*	142	94	48*	58*	12*	
136	78*	145*	95*	51*	83	13*	
137	79*	146	97	53*	85	14*	
139	80*	148	98*	54*	86*	15*	
145*	89	149	100*	55*	93*	16*	
151	90	150	101*	59*	96	17*	
153	92*	152	102*	60*	118*	18*	
155-	99	154	103*	61*	116*	19*	
157-	106*	156-	104*	64*	119-	20*	
158-	107	159-	105*	65*	122	21	
161-	108*	160-	110	60*	132*	26*	
163-	109	162-	113*	67*	144-	27	
164-	111	165-	117	69*	147	29*	
C			B			A	

class as a group does not hold its position in the Freshman year of college? And furthermore, the 86 pupils out of these 266 represented in chart 91′ who go on to college and graduate, as a group, hold their place pretty well, as shown in the graph for chart 92′.

The 81 pupils who go on to college No. 2, represented in charts 93, 95, and 97, are taken from the previous group of 212 pupils in school No. 5. Numerous marks toward the lower end of the scale here occur, as was previously the case, with the whole group. When chart 99, representing Freshman-Sophomore mathematics, is compared with the above charts, it indicates that the standards are somewhat different in the two departments.

Again, the shifting of the whole group of pupils in college mathematics toward the lower end of the scale, as shown in chart 100, indicates that the two institutions are not using similar standards. For in chart 99 the pupils are grouped about the upper end of the scale. Charts 84, 96, or 98 indicate a sort of bimodal distribution, with a somewhat larger number of marks toward the top of the scale, while in chart 100 marks are more numerous toward the lower end. Consequently the departments within college No. 2 are using different standards, although these are more alike than those used by the high school and college.

Graphs 101–9 indicate on the whole that either the standards of the two institutions are not similar or that the students who go from the high schools are not strong enough to maintain, as a group, their positions. Whenever there has been any considerable number of pupils involved in these comparisons, in very few instances do the graphs show a normal distribution of high-school pupils, examples of which, not before used, are charts 101, 103, 105, 107, indicating absolute marks; while on the other hand college No. 1, as evidenced by graphs 102, 104, 106, 108, has in the majority of cases distributed its marks somewhat according to the normal curve.

A very brief discussion of some of the charts representing the 23 different high schools, together with composite charts of these same pupils, will furnish some notion of the relation of these schools to college No. 1. See charts 107–9A.

After finding out the standing of these pupils in terms of percentage, they were translated into terms of 1, 2, 3, and then charted and graphed, separately, in the first instance, as well as charted and graphed in composite form later.[1]

[1] The percentage system is used in practically all of these high schools. Since college No. 1 uses the marks 1, 2, 3, it was thought that it would be interesting to find

Schools Nos. 22, 25, and 5 are exceptions to the skew upward.[1] While schools Nos. 5 and 22 hold their positions in the college or probably improve as a group, school No. 25 as a group does not do so well in maintaining its relative position. School No. 21 has a peculiar rectangular distribution which is hardly possible with any large number of pupils, but this group, too, improves as a whole in the college. The different relations between the standings of the high-school pupils in schools Nos. 35 and 18, and in college No. 1, either show a difference in the use of standards by the college, or it shows that high school No. 25 is the weaker of the two.

It might be concluded from the graphs in chart 109A that in such schools as Nos. 12, 23, 14, 15, 17, 20, 8, 24, 27 only the stronger pupils enter college, if it were not for the distribution of marks which occurs during the Freshman year of college work. It may be noted that the groups as a whole shift toward the lower end of the scale in college No. 1.

The actual percentage ratings were charted in chart 109 to indicate that the translation of the percentages to 1, 2, 3 did not distort in any way the grouping of the marks. For chart 107 shows the same tendency through its graph to skew toward the top as is found in chart 109. And while there are exceptions to this tendency, found in the separate graphs of the 23 schools, yet the composite charts 107 and 108 warrant the statement that there is a more normal distribution of grades in college No. 1 than in the 23 high schools considered as a whole.[2] As has been said relative to previous charts, so here it may be reiterated that it is possible to determine what the relative standing of individuals is, as well as of the group, by following out the numbers accompanied by the characters plus and minus. For illustration, in high school No. 11 out of the 15 pupils who had a standing of 1 in the high school, 6 retained this standing in the college, 7 of them

out from all the principals concerned precisely what is the range of the scale used in the various high schools, and exactly what percentages which they do use are equal to the 1, 2, 3 marks of the college.

From this investigation it was learned that the large majority of the high schools are using a range of 70–100 per cent, in which 1 equals 90–100; 2, 80–90; 3, 70–80. In the other several schools 1 equals 90–100; 2, 80–90; 3, 75–80; or 1 equals 90–95; 2, 85–90; 3, 80–85; or 1 equals 95–100; 2, 85–95; 3, 75–85; or A+ equals 97–100; A, 90–97; B+, 85–90; B, 80–85; C, 70–80.

[1] The 23 high schools do not appear in any logical order because it was necessary to rearrange the charts for the purpose of printing them.

[2] Charts 107 and 108 have been used in finding the retention between the composite 23 high schools and college No. 1.

Chart No. 71. Average of 2 semesters of Fresh. Eng. of 97 pupils, High School No. 2.

62%			39%		50%	
				3*		
				4*		
				6*		
				7*		
				10*		1*
				18*		6*
		12*	14*	21*		8*
		21*	20*	30*	2*	11*
		38*	37	34	16*	13*
		44	42	39	29*	17*
		45	46	49	33	22*
		56	54	50	36	23*
		74-	61	51	40	24*
		77-	69-	52	41	25*
		78-	71-	57	47	26*
		80-	78-	65	48	27*
	9*	85-	76-	67-	55	28*
	18*	87-	78-	70-	58	36
19*	60	88-	81-	78-	63	43
38	64	89-	84-	79-	66-	53
93-	68-	90-	94-	83-	82-	59
96-	92-	91-	97-	86-	95	62
65	70	76	80	85	90	95

Chart No. 72. Average of Fresh.& Soph. Eng. of 97 pupils, High School No. 2.

65%			45%		59%	
						1*
						2*
						5*
						8*
						11*
						13*
						16*
			20*	3*		17*
			44	4*	7*	22*
			45	6*	21*	23*
			51	10*	29*	24*
		12*	54	14*	30*	25*
		31*	57	18*	34	26*
		38	50	37	40	27*
		46	55	39	48	28*
		56	66-	42	50	33
		61	71-	49	62	35
	9*	68-	75-	69-	55	36
	15*	72-	78-	70-	58	41
	32*	81-	83-	74-	63	43
	64	87-	84-	76-	67-	47
19*	77-	89-	86-	80-	78-	53
93-	86-	90-	94-	88-	73-	59
96-	92-	91-	97-	95	82-	62
65	70	76	80	85	90	95

Chart. No. 70. Seventh Grade Eng. of 97 pupils, School No. 2'.

32 pupils										38 pupils							41	28	32 pupils																						
91										64							42	29																						
92										65	58						43	30	22																						
93										66	59						44	36	31	23	17																				
94					83				71	67	60						45	37	32	24	18	13			5																
95				87	84	80			75	72	68	61	55	52			46	38	33	25	19	14			5																
96				88	85	81	78	76	73	69	62	56	53	50			47	39	34	26	20	15	11	9	7		2														
97		90	89	86	82	79	77	74	70	63	57	54	51	49	48	40	35	27	21	16	12	10	8	4	3														1
70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100										

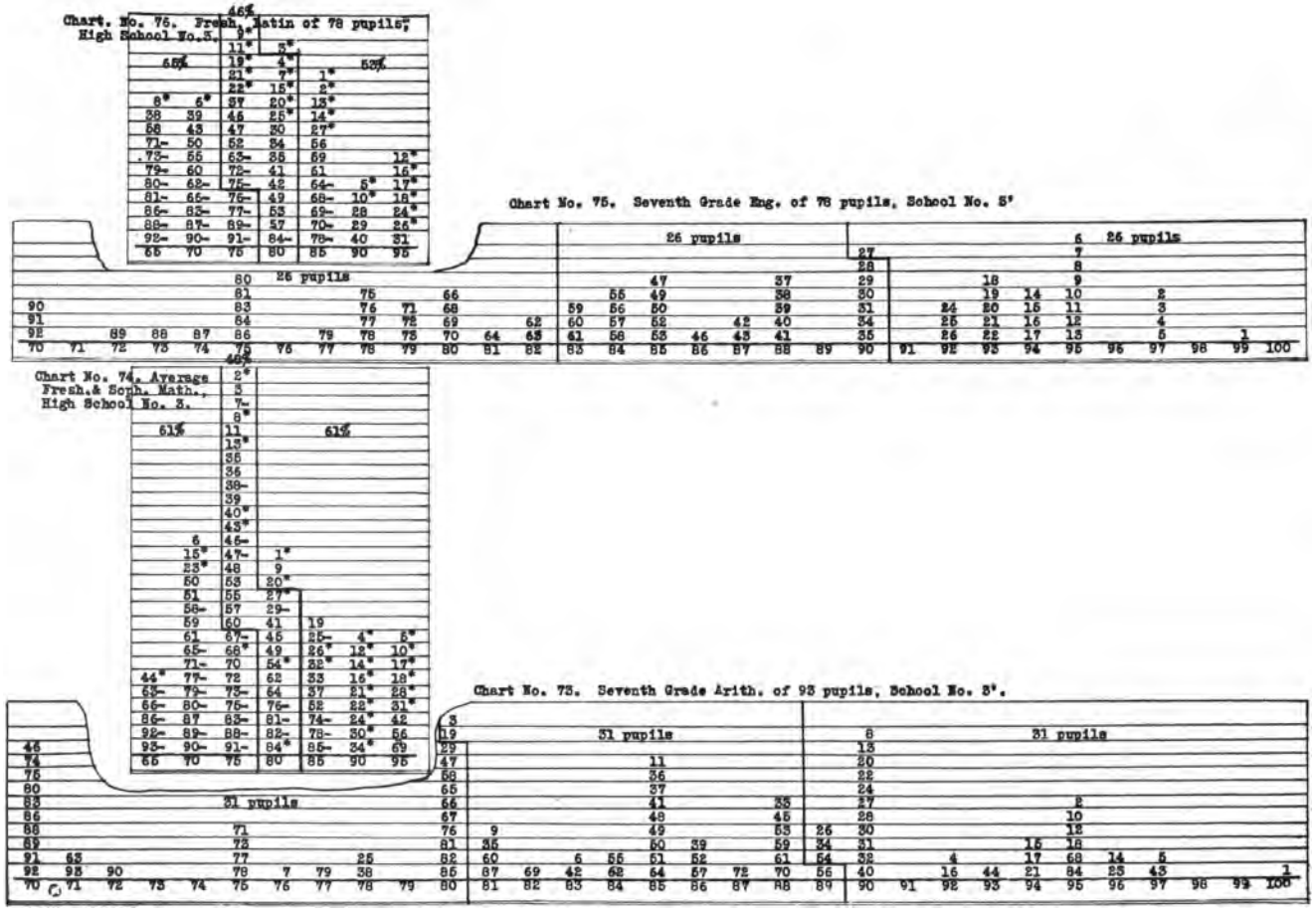


Chart. No. 76. Fresh. Latin of 78 pupils, High School No.3.
Chart No. 75. Seventh Grade Eng. of 78 pupils, School No. 5'
Chart No. 74. Average Fresh.& Soph. Math., High School No. 3.
Chart No. 73. Seventh Grade Arith. of 93 pupils, School No. 5'.
26 pupils
31 pupils

Chart No. 78. Average of 2 semesters Fresh. Eng. of 93 pupils, School No. 8.

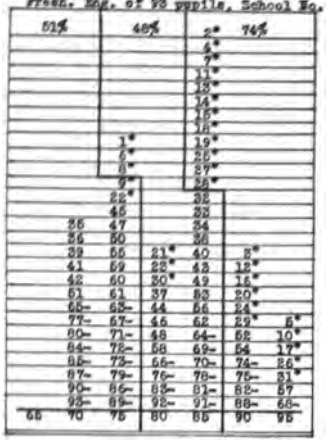


Chart No. 79. Average of Fresh.& Soph. Eng. of 92 pupils, High School No. 3.

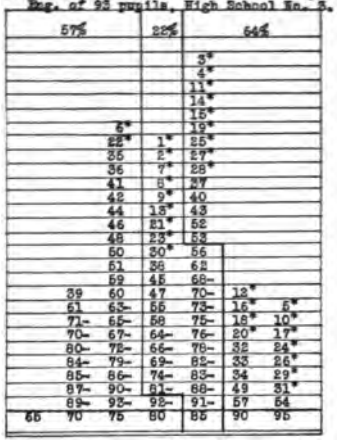


Chart No. 77. Seventh Grade Eng. of 93 pupils, School No. 3.

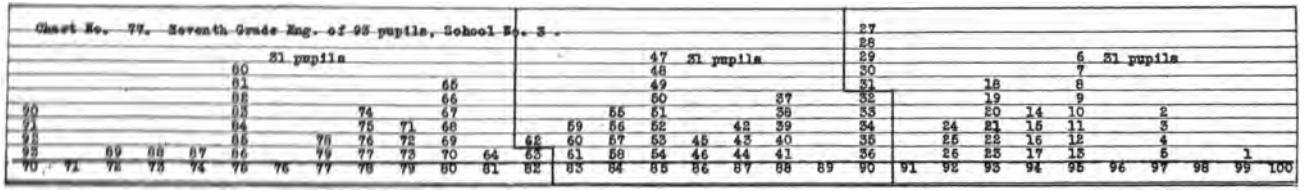


Chart No. 81. Average of 2 semesters Fresh. Eng. of 73 pupils, High School No.4.

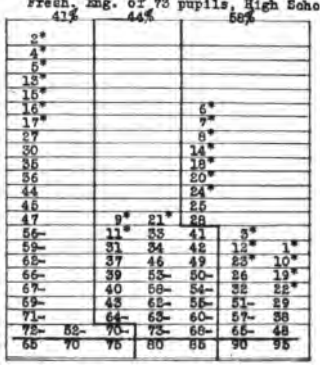


Chart No. 82. Average Fresh. & Soph. Eng. of 73 pupils, High School No.4.

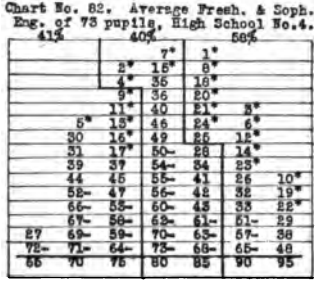
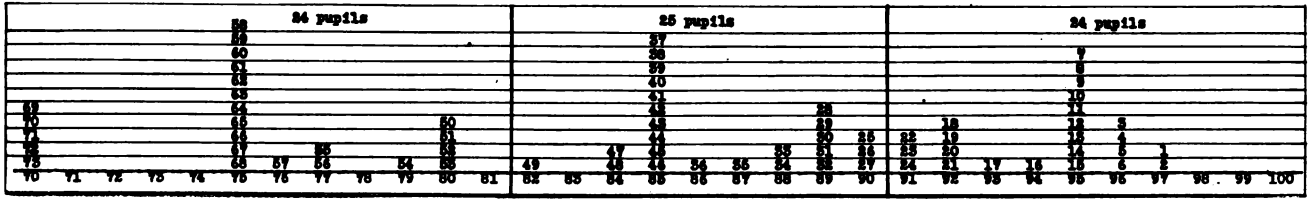


Chart No. 80. Seventh Grade Eng. of 73 pupils, School No. 4.



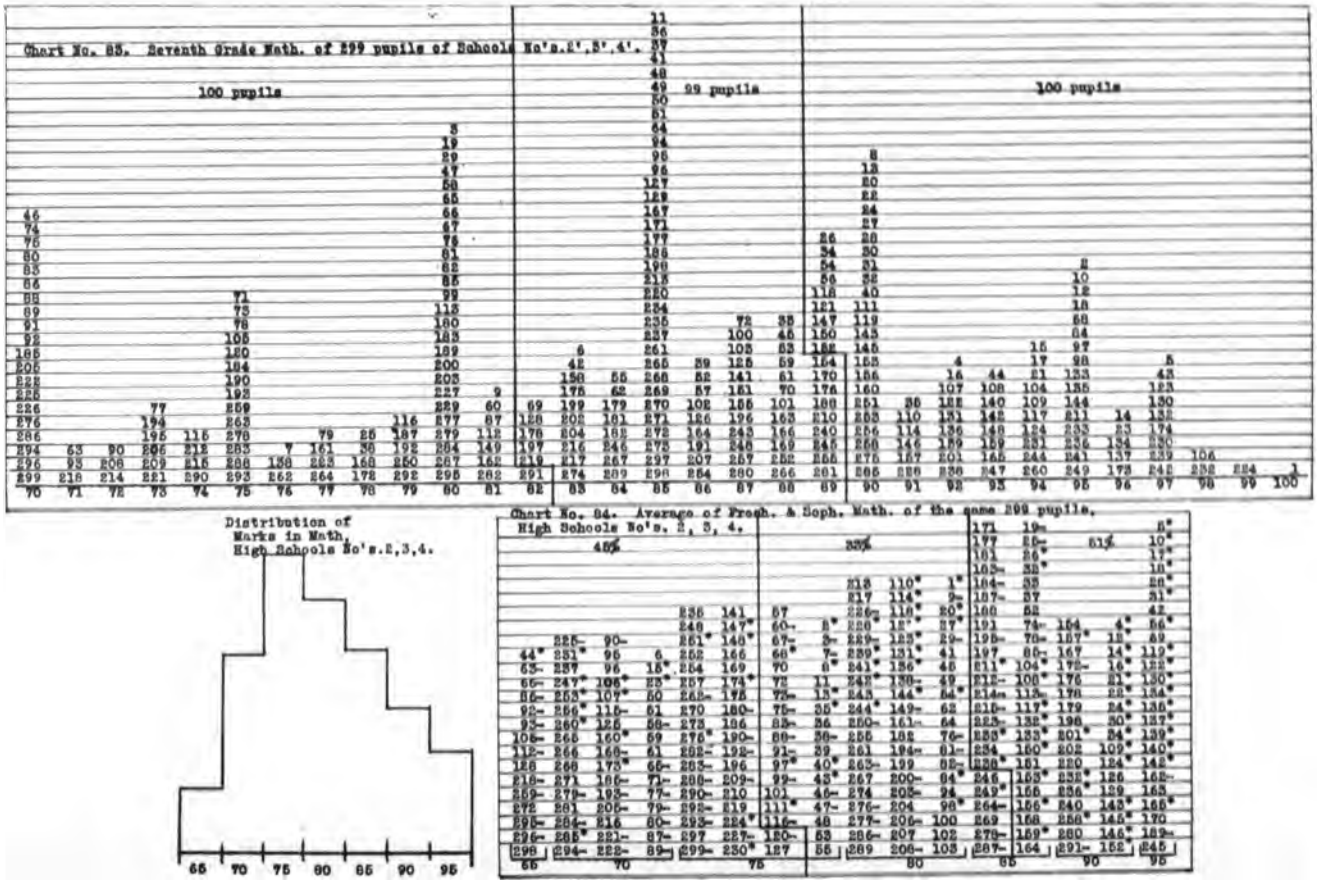


Chart No. 83. Seventh Grade Math. of 299 pupils of Schools No's.2', 3', 4'.
100 pupils
99 pupils
100 pupils
70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
Distribution of Marks in Math. High Schools No's.2,3,4.
55 60 65 70 75 80 85 90 95
Chart No. 84. Average of Frosh. & Soph. Math. of the same 299 pupils. High Schools No's. 2, 3, 4.
48%
82%
61%
55 60 65 70 75 80 85 90 95

Distribution of Marks in Latin, High Schools No's. 2, 3, 4.

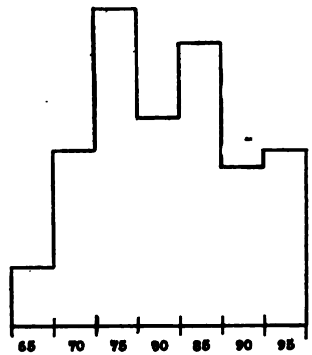


Chart No. 86. Average of Fresh. & Soph. Latin of the same 166 pupils, High Schools No's. 2, 3, 4.

65	70	75		80	85		90	95+
				3*				
	495		[illegible]	15*		57	5	
				19*				
				30*				
				34*				
	6*			37				10*
	39			42				12*
	43	121*	8*	68-			5*	16*
	50	125*	21*	106			14*	18*
	52	158-	22*	127	103	1*	17*	24*
	55	144	35*	151*	111*	2*	28*	26*
	60-	160	41	152*	117	13*	29*	119*
	66-	164	46	153*	126*	20*	31*	122*
	72-	167	53	159*	129*	25*	109*	130*
	77-	183-	59-	141*	143*	27*	136*	134*
	89-	190-	61-	147	150	40	152	137*
	90-	208-	62-	175	154	49	153	140*
	112-	214-	63-	188-	156	56	156	142*
	116	215-	83-	199-	172	57	162	146
58	128	225-	87-	200-	187-	69-	181-	159
71-	161	226-	96	212-	192-	70-	201-	164
86-	174	228*	102-	220*	207-	76-	217-	165
197-	193-	230*	105	224-	236*	78-	238	177
222-	218-	251	107*	241*	252	84-	246*	179-
267	257	266	108-	277	264	91-	259	191-
271	288-	286-	110	282-	281-	101-	277-	258

Chart No. 85. Seventh Grade Eng. of 166 pupils in Schools No's. 2', 3', 4.

55 pupils (70–83) | 56 pupils (84–90) | 55 pupils (90–100)

70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
																				27										
															49					28										
															50			37		29										
															52			39		30										
										66					53			40		31			18							
										68					96		42	42		34			19							
										69					172		43	106		35			20		5					
										70					174		103	117		111			21		8					
										101					175		106	127		126		24	22		10					
90										187					177		158	128	110	142		25	109	14	12					
91					83			76	71	188		62	59		264	46	159	152	146	143		26	123	15	13					
222				87	84			77	72	190		63	60	55	266	116	160	153	147	144		107	129	16	131		2			
223				212	86			78	193	191		112	61	56	267	165	161	154	150	238	140	122	134	17	132		3			
224		89	217	214	286	207	281	200	197	192		181	108	57	271	166	162	156	257	251	141	139	136	121	236	119	5			
226	102	138	218	215	288	206	282	201	199	277		183	179	58	272	167	164	259	258	252	220	246	137	133	241	230	228		1	130

Distribution of Marks in English, High Schools, No's. 2,3,4.

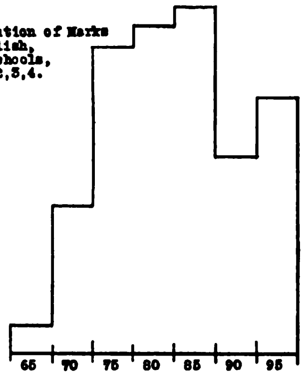


Chart No. 88. Average of Fresh. & Soph. Eng. of the same 299 pupils, High Schools No's 2,3,4

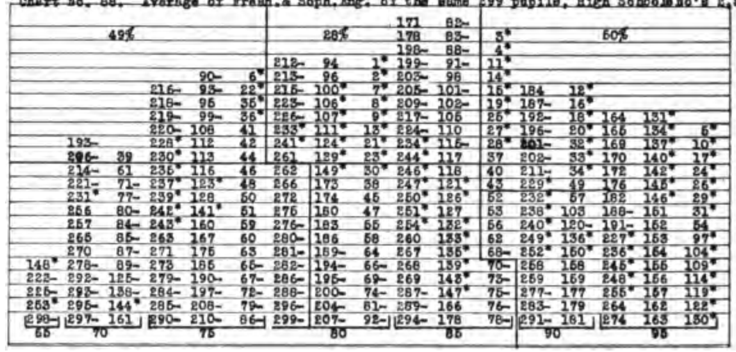
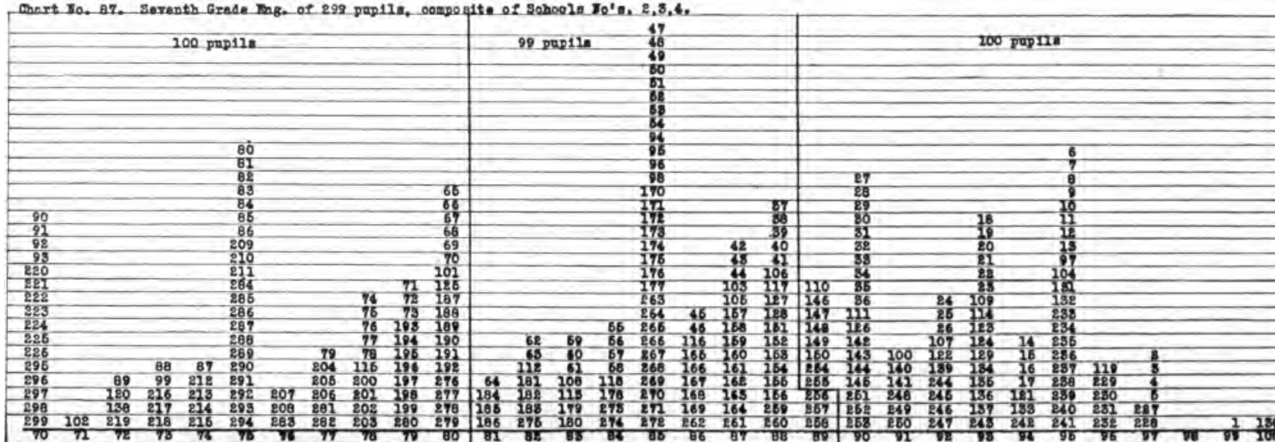


Chart No. 87. Seventh Grade Eng. of 299 pupils, composite of Schools No's. 2,3,4.



SEC. IV. SOME COMPARISONS OF HIGH SCHOOLS AND COLLEGES

This section includes a comparison of the relative standing of pupils between high schools and colleges, together with some comparisons on the basis of absolute marks.[1]

The object of this section is to discover as nearly as possible what the actual existing relation is between high schools and colleges, and then farther along, on the basis of these results and those found in sec. V, attempt to determine about what should really be expected to be the extent of correlation between the secondary and higher institutions of learning.

The variety of the systems of grading used in the following schools concerned, here again, as before, so complicates the process of comparing schools that it is not possible to draw conclusions without allowing for some modification of statements relative to the results.[2]

A general tendency, previously noted, is obvious when we compare such graphs as 89, 91′, 101, 103, 105, 107, 109, or some of the smaller graphs representing the 23 different high schools in chart 109A or 117 in the advance section; namely, that the great majority of the distributions of high-school marks tend to skew toward the top of the scale. This may be partly accounted for by the fact that none of the records of eliminated students are included, but in spite of this explanation it may be in part due also to the use of a too-narrow range of estimates.

Taking up more in detail some of the graphs representing the distributions of marks, it may be noted that the skew in chart 89 is much more exaggerated in case of the Freshman year than it is in the average of three years of English of precisely these same pupils as shown in chart 91. But do not charts 90 or 92 indicate that the rating in chart 91 is probably more justifiable than that in 89, since the high-school Freshman

[1] Since a three-estimate basis of marking practically amounts to ranking students, a few schools were charted and compared on the basis of the original grouping rather than by dividing them into equal tertile groups. The width of the broken base lines in charts 101, 102, 103, 104, 105, 106 indicates as well as the graphs the upward-skewing tendency in the high school and college already pointed out in the discussion.

[2] College No. 1 uses marks, 1, 2, 3, to represent students' standings from high to low, and these stand respectively for 90–100, 80–90, 70–80 per cent. College No. 2 uses the percentage system, ranging from 70–100; college No. 3 uses the letters A, B, C.

High school No. 1 uses the number system, 1, 2, 3, indicating respectively 95–100, 85–95, 75–85 per cent. Other high schools, as, for example, No. 7, No. 6, No. 5, use numbers, letters, and the ordinary percentage system, respectively.

class as a group does not hold its position in the Freshman year of college? And furthermore, the 86 pupils out of these 266 represented in chart 91′ who go on to college and graduate, as a group, hold their place pretty well, as shown in the graph for chart 92′.

The 81 pupils who go on to college No. 2, represented in charts 93, 95, and 97, are taken from the previous group of 212 pupils in school No. 5. Numerous marks toward the lower end of the scale here occur, as was previously the case, with the whole group. When chart 99, representing Freshman-Sophomore mathematics, is compared with the above charts, it indicates that the standards are somewhat different in the two departments.

Again, the shifting of the whole group of pupils in college mathematics toward the lower end of the scale, as shown in chart 100, indicates that the two institutions are not using similar standards. For in chart 99 the pupils are grouped about the upper end of the scale. Charts 84, 96, or 98 indicate a sort of bimodal distribution, with a somewhat larger number of marks toward the top of the scale, while in chart 100 marks are more numerous toward the lower end. Consequently the departments within college No. 2 are using different standards, although these are more alike than those used by the high school and college.

Graphs 101–9 indicate on the whole that either the standards of the two institutions are not similar or that the students who go from the high schools are not strong enough to maintain, as a group, their positions. Whenever there has been any considerable number of pupils involved in these comparisons, in very few instances do the graphs show a normal distribution of high-school pupils, examples of which, not before used, are charts 101, 103, 105, 107, indicating absolute marks; while on the other hand college No. 1, as evidenced by graphs 102, 104, 106, 108, has in the majority of cases distributed its marks somewhat according to the normal curve.

A very brief discussion of some of the charts representing the 23 different high schools, together with composite charts of these same pupils, will furnish some notion of the relation of these schools to college No. 1. See charts 107–9A.

After finding out the standing of these pupils in terms of percentage, they were translated into terms of 1, 2, 3, and then charted and graphed, separately, in the first instance, as well as charted and graphed in composite form later.[1]

[1] The percentage system is used in practically all of these high schools. Since college No. 1 uses the marks 1, 2, 3, it was thought that it would be interesting to find

Schools Nos. 22, 25, and 5 are exceptions to the skew upward.[1] While schools Nos. 5 and 22 hold their positions in the college or probably improve as a group, school No. 25 as a group does not do so well in maintaining its relative position. School No. 21 has a peculiar rectangular distribution which is hardly possible with any large number of pupils, but this group, too, improves as a whole in the college. The different relations between the standings of the high-school pupils in schools Nos. 35 and 18, and in college No. 1, either show a difference in the use of standards by the college, or it shows that high school No. 25 is the weaker of the two.

It might be concluded from the graphs in chart 109A that in such schools as Nos. 12, 23, 14, 15, 17, 20, 8, 24, 27 only the stronger pupils enter college, if it were not for the distribution of marks which occurs during the Freshman year of college work. It may be noted that the groups as a whole shift toward the lower end of the scale in college No. 1.

The actual percentage ratings were charted in chart 109 to indicate that the translation of the percentages to 1, 2, 3 did not distort in any way the grouping of the marks. For chart 107 shows the same tendency through its graph to skew toward the top as is found in chart 109. And while there are exceptions to this tendency, found in the separate graphs of the 23 schools, yet the composite charts 107 and 108 warrant the statement that there is a more normal distribution of grades in college No. 1 than in the 23 high schools considered as a whole.[2] As has been said relative to previous charts, so here it may be reiterated that it is possible to determine what the relative standing of individuals is, as well as of the group, by following out the numbers accompanied by the characters plus and minus. For illustration, in high school No. 11 out of the 15 pupils who had a standing of 1 in the high school, 6 retained this standing in the college, 7 of them

out from all the principals concerned precisely what is the range of the scale used in the various high schools, and exactly what percentages which they do use are equal to the 1, 2, 3 marks of the college.

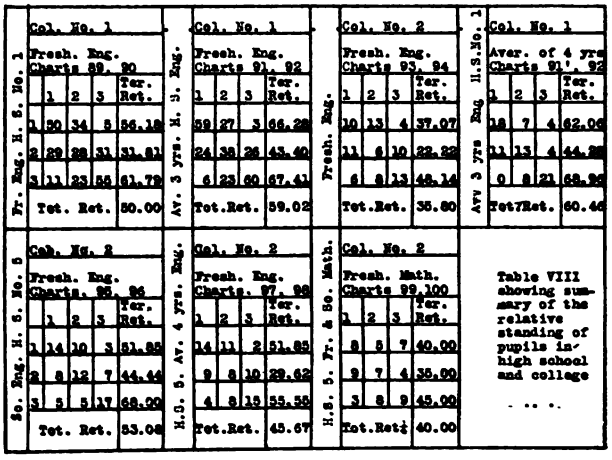
From this investigation it was learned that the large majority of the high schools are using a range of 70–100 per cent, in which 1 equals 90–100; 2, 80–90; 3, 70–80. In the other several schools 1 equals 90–100; 2, 80–90; 3, 75–80; or 1 equals 90–95; 2, 85–90; 3, 80–85; or 1 equals 95–100; 2, 85–95; 3, 75–85; or A+ equals 97–100; A, 90–97; B+, 85–90; B, 80–85; C, 70–80.

[1] The 23 high schools do not appear in any logical order because it was necessary to rearrange the charts for the purpose of printing them.

[2] Charts 107 and 108 have been used in finding the retention between the composite 23 high schools and college No. 1.

fell back to the standing represented by 2, and 2 of them fell back to a standing of 3. The fact just pointed out is indicated by the accompanying stars. This indicates that the standards of the two institutions are not the same, and probably, too, that not all of the high-school pupils are able to do the work according to the standard set up. It may mean that the standard of the college ought to be modified, together with the standards of the high schools.

Since pupils need to readjust themselves whenever they enter different institutions, it was thought that it would be of some significance to compare the first year of the high-school English with the first year of college English, as well as to make the comparison between the average of the three years' high-school English and the Freshman college



Fr. Eng. H. S. No. 1	Col. No. 1 — Fresh. Eng. Charts 89, 90				Av. 3 yrs. H. S. Eng.	Col. No. 1 — Fresh. Eng. Charts 91, 92				Fresh. Eng.	Col. No. 2 — Fresh. Eng. Charts 93, 94				Av 3 yrs H.S.Eng. No. 1	Col. No. 1 — Aver. of 4 yrs Charts 91', 92			
	1	2	3	Ter. Ret.		1	2	3	Ter. Ret.		1	2	3	Ter. Ret.		1	2	3	Ter. Ret.
1	30	34	5	56.18		29	27	3	66.28		10	13	4	37.07		18	7	4	62.06
2	29	28	31	31.81		24	38	26	43.40		11	6	10	22.22		11	13	4	44.28
3	11	23	55	61.79		6	23	60	67.41		6	8	13	48.14		0	8	21	68.96
	Tot. Ret.			50.00		Tot. Ret.			59.02		Tot. Ret.			35.80		Tot Ret.			60.46

So. Eng. H. S. No. 5	Col. No. 2 — Fresh. Eng. Charts 95, 96				H.S. 5. Av. 4 yrs. Eng.	Col. No. 2 — Fresh. Eng. Charts 97, 98				H.S. 5. Fr. & So. Math.	Col. No. 2 — Fresh. Math. Charts 99,100			
	1	2	3	Ter. Ret.		1	2	3	Ter. Ret.		1	2	3	Ter. Ret.
1	14	10	3	51.85		14	11	2	51.85		8	8	7	40.00
2	8	12	7	44.44		9	8	10	29.62		9	7	4	36.00
3	5	5	17	68.00		4	8	15	55.55		3	8	9	45.00
	Tot. Ret.			53.08		Tot. Ret.			45.67		Tot. Ret.			40.00

Table VIII showing summary of the relative standing of pupils in high school and college

English. Table VIII indicates that the total retention is 59.02 per cent in the latter comparison and 50 per cent in the former, which probably signifies, in harmony with statements already made, that it takes the high-school student some time to get adjusted in his first year's work. A further comparison in charts 91′ and 92′ of the three years' average of high-school English with the four years of English taken in college corroborates this statement. For the 86 pupils out of these 266 show a somewhat similar retention to that in charts 91 and 92, namely, 60.46 per cent, as is shown in table VIII.

The results of the comparisons in charts 93 and 94, together with the results in charts 97 and 98, as shown in table VIII, also justify the former statement. The total retention for high school No. 5 and college No. 2

is 53.08 per cent between the Sophomore high-school English, and Freshman college English; the total retention between Freshman high-school and Freshman college English is low, namely, 35.80 per cent; while that between the four years' average and the Freshman college English is 45.67 per cent.

On the basis of the single subjects compared, the results warrant the conclusion that the correlation between the high school and college is better for high school No. 1 and college No. 1 than it is for high school No. 5 and college No. 2.

The amount of retention for the schools compared on the basis of absolute marks is somewhat similar to that of the comparisons on the basis of the relative standing, as shown in table IX. The total retention for English between high school No. 7 and college No. 1 is 53.57

Fr. Eng. H. S. No. 7	Col. No. 1			
	Fr. Eng Ch. 101, 102.			
	I	II	III	Div. Ret.
1	26	23	3	50.00
2	4	15	5	62.50
3	2	2	4	50.00
Fr.	Tot. Ret			53.57

Fr. Math. H. S. No. 6	Col. No. 3			
	Fr. Col. Math Ch. 103, 104.			
	A	B	C	Div. Ret.
E	52	28	17	53.60
G	11	48	11	68.57
F	2	4	11	64.60
Fr.	Tot. Ret.			60.32

Fr. Eng. H. S. No. 6	Col. No. 3			
	Fr Eng Ch. 105, 106.			
	A	B	C	Div. Ret
E	41	45	15	40.95
G	6	24	19	48.97
F	2	7	6	40.00
Fr.	Tot Ret			43.00

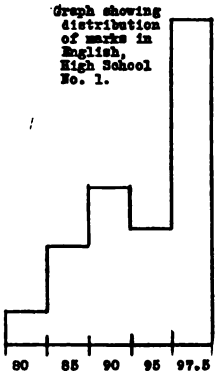
TABLE IX

Showing retention between high school and college on basis of absolute marks.

per cent. This is higher than is the retention for English between high school No. 6 and college No. 3, which was found to be 43 per cent. The high retention of 60.32 per cent in mathematics for school No. 6 may be due to the fact that these pupils have been a select body with a special interest in mathematics. It may be due to the fact that the standards of the two colleges are different.

Composite charts 107 and 108 represent pupils from 23 different high schools, who go on to college. The total retention in the subjects of English on the basis of absolute marks is 53.30 per cent.[1] The exact retention for high school No. 1 and college No. 1 between Freshman high-school English and Freshman college English is 77.52 per cent; between the three years' average of high-school English and the Freshman college English, 88.76; between the three years' average of high school and the four years' average of college English, 87.93;

[1] The exact retention for each division is as follows: 45.91 per cent for division I; 28.57 for division II; and 71.73 for division III. Retention here is based upon the number of pupils in the original groups respectively.



Graph showing distribution of marks in English, High School No. 1.

Chart No.89. Average of 2 semesters in English of 266 pupils, High School No. 1.

89 pupils.					88 pupils.				89 pupils.				
						121	24						
						130	51	180	160	85	45	20	
			219	134	25	141	54	181	161	86	46	21	1
	140	61	220	143	42	203	55	182	162	89	47	22	2
	142	66	221	144	72	204	57	183	163	90	48	23	3
	147	68	222	145	73	205	62	184	164	91	49	26	4
	149	71	227	146	77	206	70	185	165	94	50	27	5
	153	74	229	148	83	211	76	186	166	97	51	28	6
	154	78	230	198	88	212	79	187	167	108	62	29	7
41	156	80	234	199	92	215	81	188	168	110	83	30	8
120	261	93	237	200	95	223	84	189	169	116	86	32	9
124	262	109	239	201	96	224	87	190	170	119	88	33	10
133	264	111	240	202	99	225	98	191	171	125	89	34	11
151	265	113	242	207	100	226	101	192	172	126	60	35	12
157	266	118	244	209	104	228	102	193	173	128	63	36	13
205	267	122	245	210	112	231	105	194	174	132	64	37	14
253	269	155	246	213	117	232	106	196	175	150	65	38	15
258	260	136	247	214	123	233	107	196	176	152	67	39	16
262	261	137	248	216	127	235	108	197	177	155	69	40	17
265	263	138	249	217	129	236	114	238	178	158	76	43	18
266	264	139	250	218	131	241	115	243	179	159	82	44	19
80	85			90		93				97.5			

Graph showing distribution of marks in English of same 266 students, College No. 1.

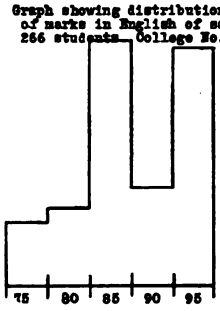


Chart No. 90. Fresh. English of the same 266 students, College No. 1.

61%						31%				56%				
				230-	162*	118	80-	24	126*	3*	187	143-		
				232	166*	119-	83	25	135-	18*	186	146-	59*	22*	1*
				233	167*	114	84	27*	148-	20*	189	152*	62	26*	2*
		200-		234-	172	118	86*	35*	154-	21*	190	157-	63*	28*	4*
		203	66-	235	173	116*	87	37*	180	23*	192	159*	77	29*	5*
		208	67*	236	176	120-	88	38*	186	33*	193	160*	79	30*	6*
136-	41-	211	68-	241	178	121	89*	39*	194	34*	196	163*	82*	31	7*
139-	71-	218-	70	246-	181	122-	91*	42	205	43*	196	164*	90*	32*	8*
149-	76	220-	78-	248-	185	123	92	46*	212	48*	197	165*	101	36*	9*
166-	96	228-	100	250-	191	126*	94*	52*	225	49*	201-	168*	102	40*	10*
198-	99	223	108	251-	199-	134-	95	60*	226	50*	202-	169*	105	44*	11*
206-	117	229-	137-	253-	207-	136-	97*	61-	237-	54	204	170	110*	45*	12*
217-	124-	236	142-	254-	210-	145-	98	65*	239-	57	209-	174	116-	47*	13*
219-	127-	242-	144-	256-	213-	150*	104	69*	240-	64*	216-	176	119*	51*	14*
227-	129-	243-	147-	263-	214-	151-	106	72	243	81	228	179	125*	52*	15*
255-	130	256-	156*	264-	216	155-	107	73	247-	86*	231	182	132*	53*	16*
256-	131-	259-	171	265-	221-	156*	109-	74-	249-	93-	244-	185	140-	55	17*
261-	133-	260-	177	266-	224	161*	111-	75*	257-	103*	262-	184	141	56*	19*
75		80				85			90				95		

Graph showing distribution of marks in English of 266 pupils, in High School No. 1.

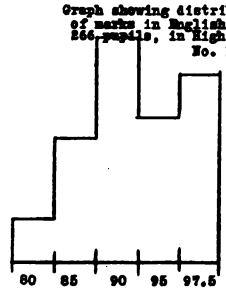


Chart No. 91. Average of 3 years in English for each of the 266 pupils, High School No. 1.

89 pupils				88 pupils				89 pupils				
149								152	26	1		
153	61							155	37	2		
154	68	210	143					159	38	3		
156	71	211	145	101	25			161	39	4		
206	74	212	146	106	42			164	40	5		
213	77	217	147	106	56	182	62	20	165	43	6	
214	78	220	148	107	57	184	65	21	166	44	7	
41 218	80	221	157	108	60	191	67	22	167	45	8	
78 219	83	227	158	114	64	204	75	24	168	47	9	
111 222	88	230	172	116	66	205	79	26	169	48	10	
113 223	95	234	173	117	70	209	81	28	170	50	11	
122 224	99	235	177	118	73	216	102	29	183	52	12	
124 229	100	236	180	121	76	216	115	30	185	53	13	
133 245	104	237	181	123	84	225	150	31	187	63	14	
139 250	109	239	186	125	86	226	160	33	188	69	15	
142 251	112	240	198	126	87	228	162	34	189	82	16	
151 253	120	241	199	129	89	231	163	46	190	85	17	
252 254	127	242	200	130	91	232	171	64	192	90	18	
256 255	136	244	201	131	92	235	174	61	193	97	19	
259 256	137	246	202	132	93	236	175	49	194	103	23	
261 257	138	248	203	134	94	243	176	56	195	110	27	
266 260	140	262	207	135	96	247	178	58	196	119	38	
266 264	144	263	208	141	98	249	179	59	197	128	55	
80	85		90			93			97.5			

Graph showing distribution of marks in English of same 266 students, College No. 1.

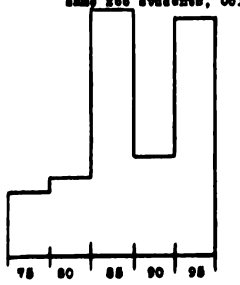


Chart No. 92. Fresh. English of the same 266 students, College No. 1.

67%						45%				65%				
				250-	182	118-	80-	54*	128*	8*	187*	143		
				252	166*	118-	82-	55	135	18*	188*	146	59*	22* 1*
				255	167*	114	84	57*	148	20*	189*	155*	62*	26* 2*
		200-		254-	172	116	86	58*	154-	21*	190*	157	62*	28* 4*
		203-	66	255-	173	116	87	57*	160	22*	192*	159*	77-	29* 8*
		206-	67	256-	176	120-	88-	58*	186	32*	193*	160	79	30* 6*
136-	41-	211-	68-	241-	178	121	89	59*	194*	34*	195*	163	82*	31* 7*
139-	71-	218-	70	246-	181	122-	91	42	205	43*	196*	164*	90*	32* 8*
149-	76	220-	78-	248-	186*	123	92	46*	219-	46*	197*	165*	101	36* 9*
156-	96	222-	100-	250-	191	126	94	58*	225	49*	201-	168*	102	40* 10*
198	99-	223-	108	251-	199-	134	95-	60	226	50*	202-	169*	105	44* 11*
206-	117	229-	127-	253-	207-	138-	97*	61-	227-	54*	204	170*	110*	46* 12*
217-	124-	230	142-	254-	210-	146	98	66*	239-	57	209	174	118	47* 13*
219-	127-	242-	144-	255-	218-	150	104-	69*	240-	64	216	176	119*	51* 14*
227-	129	243-	147	263-	214-	151-	106	72-	243	61	228	179	125	52* 16*
253-	150	256-	150	264-	215	158-	107	73	247	65*	231	182	132	53* 16*
256-	131	259-	171	265-	221-	158*	109-	74-	249	93	244-	183*	140-	55 17*
261-	133-	260-	177	266-	224-	161*	111-	76	257-	103*	262-	184	141	56* 19*
75		80		85				90				95		

Distribution of Marks in Chart

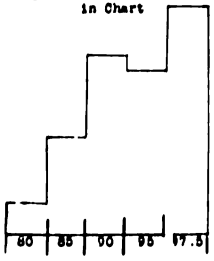


Chart No.91' average of 3 years English of 86 pupils, H.S.No.1

29 pupils			28 pupils			29 pupils			
	68								
	71	167	70						
	77	186	89	150	25	164			
	86	199	91	162	28	166	47	2	
	104	203	105	174	29	168	48	4	
	120	210	106	178	30	169	50	5	
	149	211	117	182	31	170	59	6	
	156	212	116	204	33	183	82	8	
184	214	227	121	209	46	185	90	32	
133	229	236	126	216	49	187	103	43	
252	254	242	234	230	79	189	128	44	
260	264	263	143	233	115	197	152	45	
80	85	90		95			97.5		

Distribution of Marks in chart

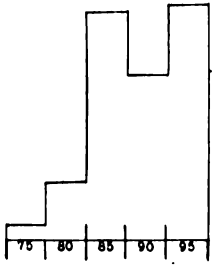


Chart No.92' average of English of 86 graduates College No.1

68%			44%			62%		
		169*	68-					
		178	89*					
		185*	77-					
		203-	79					
		210-	89	121	31	169*	33	
		211-	105	150	32*	174	44*	2*
		214-	107	152*	43*	182	45*	4*
	71-	215	115	162	46	183*	50*	5*
	91	227-	120-	170*	47*	187*	82*	8*
	104-	229-	126	186-	48*	189*	90*	9*
	133-	232	134-	199-	49	197*	103*	26*
	149-	242-	143-	212-	70	204	106	28
124-	252-	254-	160	236-	88-	209	125	29
156-	264-	263-	167-	266-	115	233	164*	30
75	80		85		90		95	

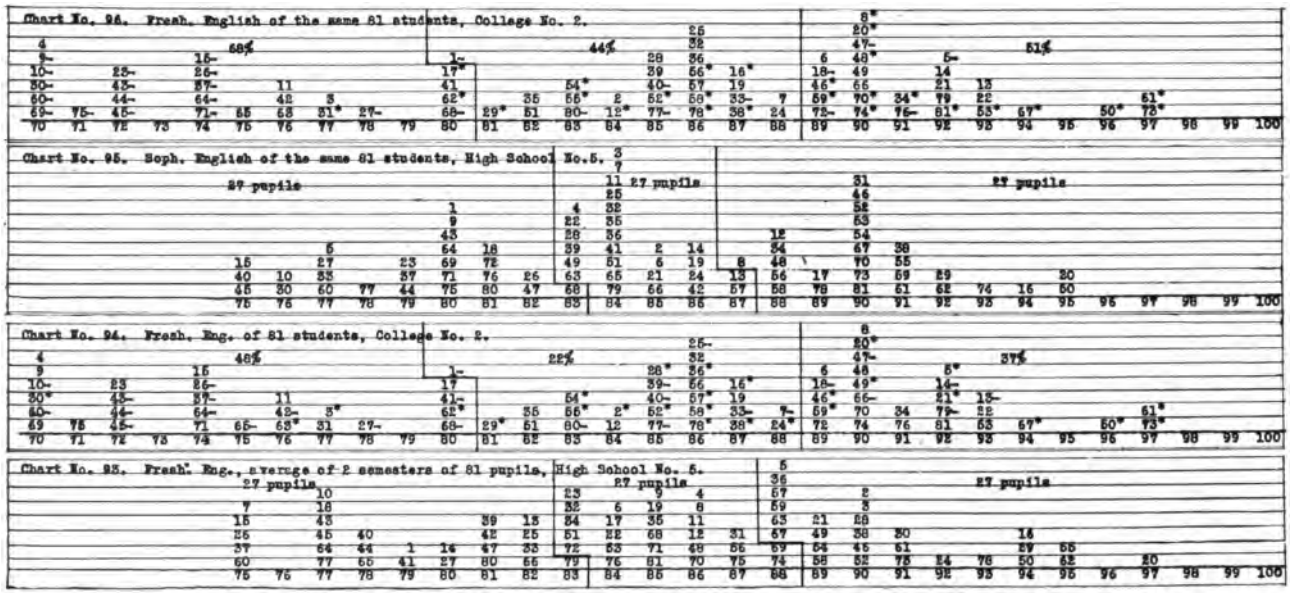


Chart No. 96. Fresh. English of the same 81 students, College No. 2.
Chart No. 95. Soph. English of the same 81 students, High School No.5.
Chart No. 94. Fresh. Eng. of 81 students, College No. 2.
Chart No. 93. Fresh. Eng., average of 2 semesters of 81 pupils, High School No. 5.

Chart No. 100. Average of 2 semesters of Fresh. Math. of the same 60 students, College No. 2.

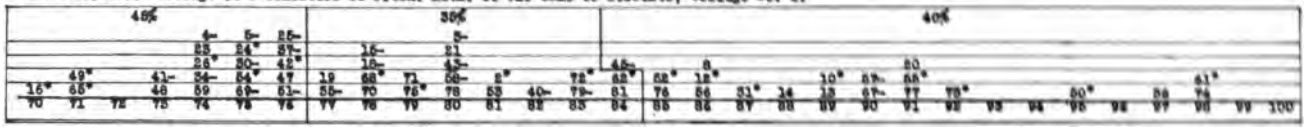


Chart No. 99. Average of Fresh.& Soph. Math. of 60 pupils (out of 81 in English), High School No. 8.

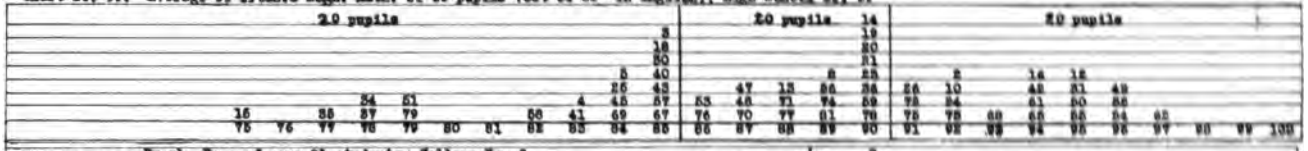


Chart No. 98. Fresh. Eng. of same 81 students, College No. 2.

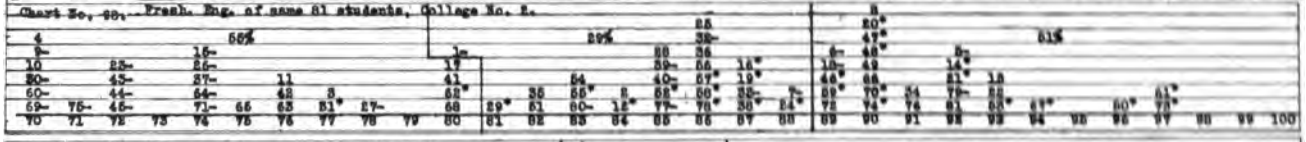


Chart No. 97. Average of 4 years of English of the same 81 pupils, High School No. 8.

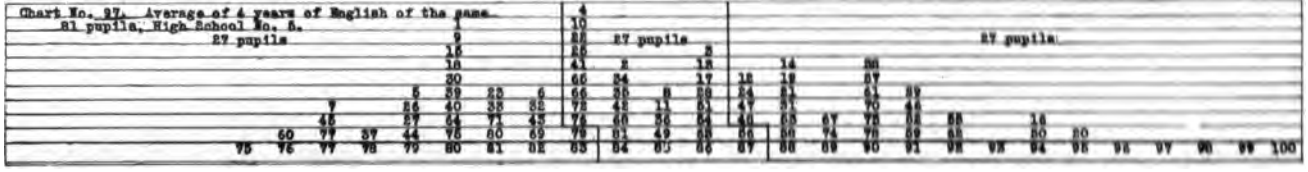


Chart No. 101. Fresh. Eng. of 84 pupils, High School No. 7.

		2	1
		3	4
	49	29	5
	50	30	6
	54	31	7
	55	32	8
	56	33	9
	57	34	10
	58	35	11
	59	36	12
	60	37	13
	61	38	14
	63	39	15
	65	40	16
	66	41	17
	67	42	18
	68	43	19
	69	44	20
62	70	45	21
78	71	46	22
79	72	47	23
80	73	48	24
81	74	51	25
82	75	52	26
83	76	53	27
84	77	64	28
3	2	1	

Distribution of Marks in Chart No. 101.

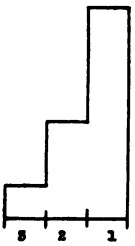
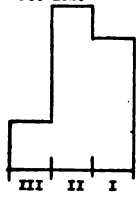


Chart No. 102. Fresh. Eng. of the same 84 pupils, College No. 1.

	47*	15*		
	49	46*		
	50	20*		
	51*	21*		
	55*	23*	2*	1*
	56	25*	4*	2*
	58	26*	6*	3*
	59	27*	8*	4*
24*	60	28*	35*	5*
25*	61	29*	36*	10*
52*	65	30*	38*	11*
57	66	31*	39*	12*
62-	69	32*	48*	13*
66	71	37*	54	14*
67	74	40*	55	16*
70	75	41*	63	17*
73	76	42*	64*	18*
82-	77	43*	72	19*
83-	79-	44*	78-	33*
84-	81-	45*	80-	34*
III	II		I	

Distribution of Marks in Chart No. 102.



Distribution of Marks in Chart No. 103.

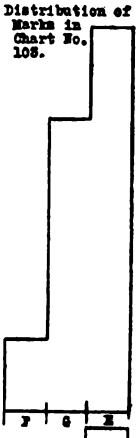


Chart No. 103. Fresh. Math. of 184 pupils. High School No. 6.

	143	118		75	49	23	
	144	119		76	50	24	
	145	120		77	51	25	
	146	121		78	52	26	1
	147	122		79	53	27	2
	148	123	41	80	54	28	3
	149	124	55	81	56	29	4
	150	125	100	82	57	30	5
168	151	126	101	83	58	31	6
169	152	127	102	84	59	32	7
170	153	128	103	85	60	33	8
171	154	129	104	86	61	34	9
172	155	130	105	87	62	35	10
173	156	131	106	88	63	36	11
174	157	132	107	89	64	37	12
175	158	133	108	90	65	38	13
176	159	134	109	91	66	39	14
177	160	135	110	92	67	40	15
178	161	136	111	93	68	42	16
179	162	137	112	94	69	43	17
180	163	138	113	95	70	44	18
181	164	139	114	96	71	45	19
182	165	140	115	97	72	46	20
183	166	141	116	98	73	47	21
184	167	142	117	99	74	48	22
F		G			E		

Distribution of Marks in Chart No. 104.

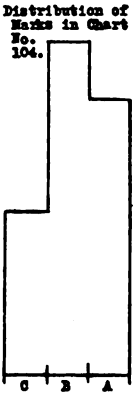


Chart No. 104. Fresh. Math. of the same 184 pupils, College No. 3.

			7*	4*				
		10*	13*	14*				
	72*	70*	125	16*	81*	31*		
	77*	73*	130	25*	86*	32*		
	85*	82*	132	37*	87*	33*		
	86*	84*	133	38*	89*	35*		
	93*	88*	134	39*	90*	36*		
	102	94*	136	44*	91	40*		
	104	103	140	45*	92*	42*		
	109	105	141	46*	96*	43*		
	158	110	142	48*	96*	49*		
	184	111	145	53*	98*	50*	1*	
	156	112	147	54*	99*	51*	3*	
2*	159	113	148	57*	101	52*	5*	
6*	162	114	150	62*	108	58*	6*	
9*	163	116	152	65*	123	59*	16*	
11*	170-	118	155	69*	131	60*	17*	
12*	171-	120	160	78*	136	61*	18*	
20*	174-	122	161	97*	137	63*	19*	
24*	175-	126	164	100	143	64*	21*	
34*	176-	127	165	106	144	66*	22*	
41	177-	128	166	107	146	71*	28*	
47*	179-	129	167	116	151	74*	26*	
55	180-	138	169-	117	156	75*	27*	
56*	182-	139	172-	119	157	76*	28*	
67*	183-	149	173-	121	168-	79*	29*	
68*	184-	153	181-	124	178-	80*	30*	
C			B			A		

Distribution of Marks in Chart No. 105.

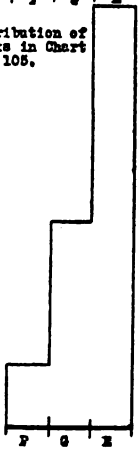


Chart No. 105. Fresh. Eng. of 166 pupils, High School No. 8.

			77				
	124		78	52	26	1	
	125	27	79	53	28	2	
	126	81	80	54	29	3	
	127	82	86	55	30	4	
	128	83	87	56	31	5	
	129	84	88	57	32	6	
	130	85	91	58	33	7	
	131	89	92	59	34	8	
	133	90	93	60	35	9	
	134	94	95	61	36	10	
119	135	96	98	62	37	11	
140	136	97	100	63	38	12	
141	137	99	101	64	39	13	
144	138	102	103	65	40	14	
156	139	107	104	66	41	15	
156	142	109	105	67	42	16	
157	146	110	106	68	43	17	
158	147	111	108	69	44	18	
159	148	112	113	70	45	19	
160	149	114	115	71	46	20	
161	150	117	116	72	47	21	
162	151	118	121	73	48	22	
163	152	120	132	74	49	23	
164	153	122	143	75	50	24	
165	154	123	145	76	51	25	
F		G			E		

Distribution of Marks in Chart No. 106.

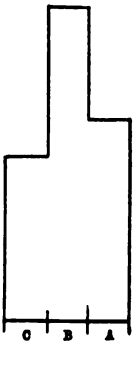
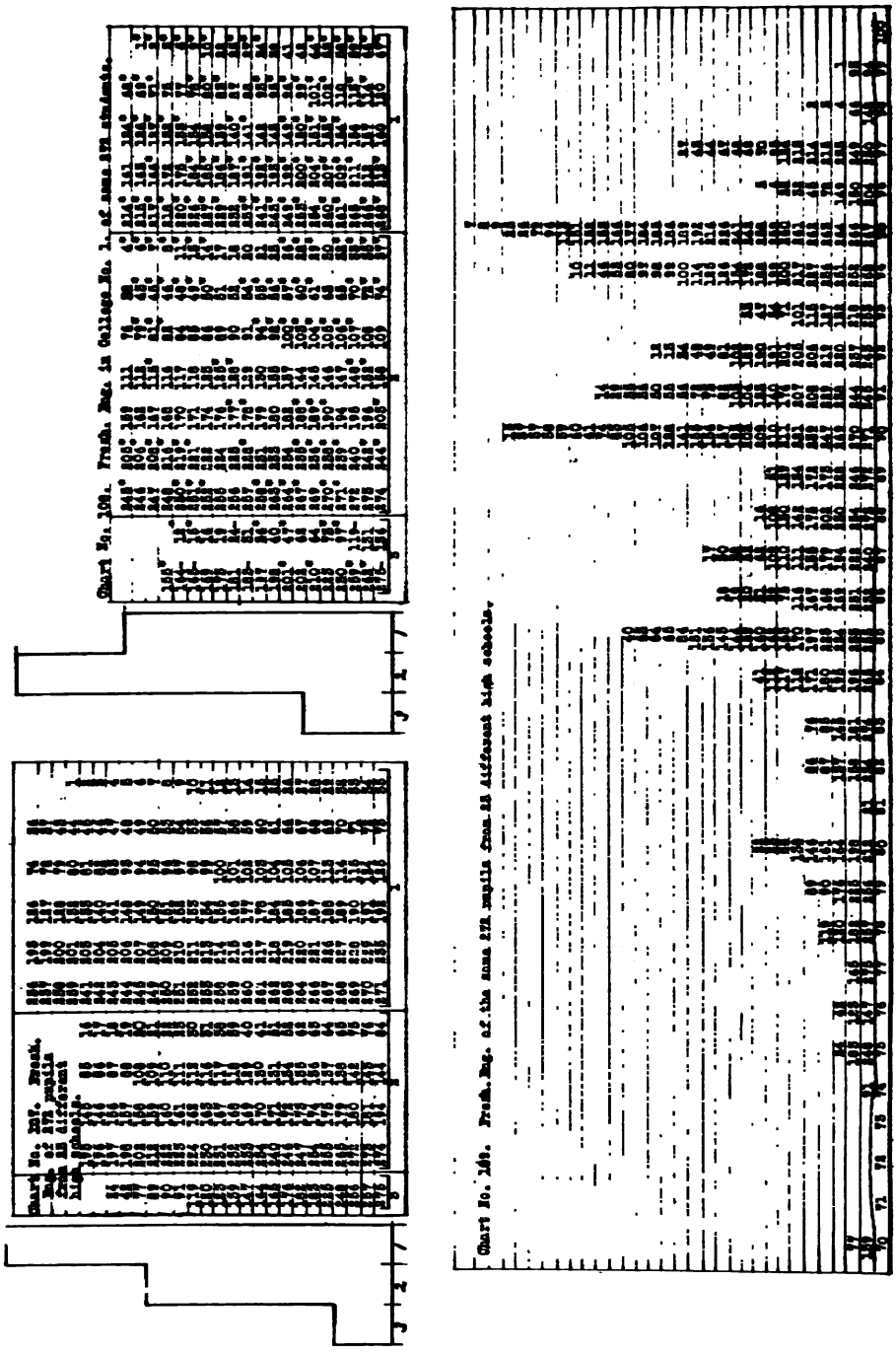
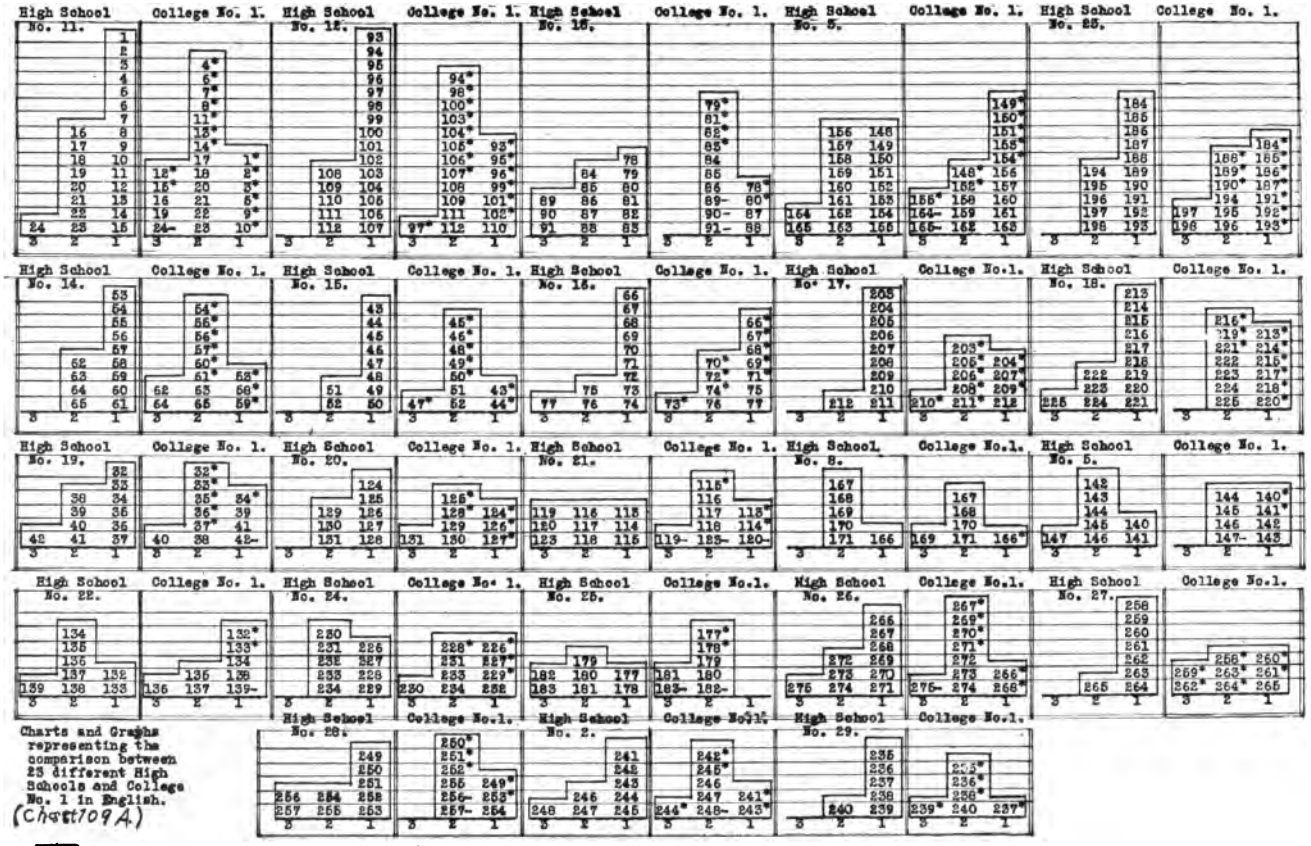


Chart No. 106. Fresh. Eng. of the same 166 pupils, College No. 3.

				22*				
		118	70*	23*	80*			
		120	71*	24*	81*	1*		
		121*	72*	25*	82*	2*		
		123	73*	26*	83*	3*		
		125	74*	35*	84*	4*		
112	60*	128	75*	37*	86*	5*		
114	86*	129	81	38*	89*	6*		
124	87*	133	82	41*	40*	7*		
126	62*	134	84	42*	44*	8*		
127	63*	136	87*	43*	47*	9*		
130	68*	140-	88*	45*	49*	10*		
131	76*	141-	91*	46*	52*	11*		
135	77*	142	94	48*	58*	12*		
136	78*	145*	95*	61*	83	13*		
137	79*	146	97	53*	85	14*		
139	80*	148	98*	54*	86*	15*		
145*	89	149	100*	55*	93*	16*		
161	90	150	101*	59*	96	17*		
163	92*	152	102*	60*	115*	18*		
165-	99	154	103*	61*	116*	19*		
167-	106*	156-	104*	64*	119-	20*		
168-	107	159-	105*	65*	122	21*		
161-	108*	160-	110	60*	132*	26*		
163-	109	162-	113*	67*	144-	27		
164-	111	165-	117	69*	147	29*		
C			B			A		





Charts and Graphs representing the comparison between 23 different High Schools and College No. 1 in English.
(Chart 109 A.)

fell back to the standing represented by 2, and 2 of them fell back to a standing of 3. The fact just pointed out is indicated by the accompanying stars. This indicates that the standards of the two institutions are not the same, and probably, too, that not all of the high-school pupils are able to do the work according to the standard set up. It may mean that the standard of the college ought to be modified, together with the standards of the high schools.

Since pupils need to readjust themselves whenever they enter different institutions, it was thought that it would be of some significance to compare the first year of the high-school English with the first year of college English, as well as to make the comparison between the average of the three years' high-school English and the Freshman college

Fr. Eng. H. S. No. 1	Col. No. 1 Fresh. Eng. Charts 89, 90				
		1	2	3	Ter. Ret.
	1	50	34	5	56.18
	2	29	28	31	31.81
	3	11	23	55	61.79
	Tot. Ret.				50.00

Av. 3 yrs. H. S. Eng.	Col. No. 1 Fresh. Eng. Charts 91, 92				
		1	2	3	Ter. Ret.
		59	27	3	66.28
		24	38	26	43.40
		6	23	60	67.41
	Tot. Ret.				59.02

Fresh. Eng.	Col. No. 2 Fresh. Eng. Charts 93, 94				
		1	2	3	Ter. Ret.
		10	13	4	37.07
		11	6	10	22.22
		4	8	13	48.14
	Tot. Ret.				35.80

Av. 3 yrs. H. S. No. 1 Eng.	Col. No. 1 Aver. of 4 yrs Charts 91', 92'			
	1	2	3	Ter. Ret.
	18	7	4	62.06
	11	13	4	44.28
	0	8	21	68.26
	Tot Ret.			60.46

So. Eng. H. S. No. 5	Col. No. 2 Fresh. Eng. Charts. 95, 96				
		1	2	3	Ter. Ret.
	1	14	10	3	51.85
	2	8	12	7	44.44
	3	5	5	17	68.00
	Tot. Ret.				53.08

H.S. 5. Av. 4 yrs. Eng.	Col. No. 2 Fresh. Eng. Charts. 97, 98				
		1	2	3	Ter. Ret.
		14	11	2	51.85
		9	8	10	29.62
		4	8	15	55.55
	Tot. Ret.				45.67

H.S. 5. Fr. & So. Math.	Col. No. 2 Fresh. Math. Charts 99,100				
		1	2	3	Ter. Ret.
		8	8	7	40.00
		9	7	4	35.00
		3	8	9	45.00
	Tot. Ret.				40.00

Table VIII showing summary of the relative standing of pupils in high school and college

English. Table VIII indicates that the total retention is 59.02 per cent in the latter comparison and 50 per cent in the former, which probably signifies, in harmony with statements already made, that it takes the high-school student some time to get adjusted in his first year's work. A further comparison in charts 91′ and 92′ of the three years' average of high-school English with the four years of English taken in college corroborates this statement. For the 86 pupils out of these 266 show a somewhat similar retention to that in charts 91 and 92, namely, 60.46 per cent, as is shown in table VIII.

The results of the comparisons in charts 93 and 94, together with the results in charts 97 and 98, as shown in table VIII, also justify the former statement. The total retention for high school No. 5 and college No. 2

is 53.08 per cent between the Sophomore high-school English, and Freshman college English; the total retention between Freshman high-school and Freshman college English is low, namely, 35.80 per cent; while that between the four years' average and the Freshman college English is 45.67 per cent.

On the basis of the single subjects compared, the results warrant the conclusion that the correlation between the high school and college is better for high school No. 1 and college No. 1 than it is for high school No. 5 and college No. 2.

The amount of retention for the schools compared on the basis of absolute marks is somewhat similar to that of the comparisons on the basis of the relative standing, as shown in table IX. The total retention for English between high school No. 7 and college No. 1 is 53.57

Fr. Eng. H. S. No. 7	Col. No. 1				Fr. Math. H. S. No. 6	Col. No. 3				Fr. Eng. H. S. No. 6	Col. No. 3			
	Fr. Eng Ch. 101, 102.					Fr. Col. Math Ch. 103, 104.					Fr Eng Ch. 105, 106.			
	I	II	III	Div. Ret.		A	B.	C.	Div. Ret.		A	B	C	Div. Ret
1	26	23	3	50.00	E	52	28	17	53.60	E	41	45	15	40.98
2	4	15	5	62.50	G	11	48	11	68.57	G	6	24	19	48.97
3	2	2	4	50.00	F	2	4	11	64.60	F	2	7	6	40.00
Tot. Ret				53.57	Tot. Ret.				60.32	Tot Ret				43.00

TABLE IX

Showing retention between high school and college on basis of absolute marks.

per cent. This is higher than is the retention for English between high school No. 6 and college No. 3, which was found to be 43 per cent. The high retention of 60.32 per cent in mathematics for school No. 6 may be due to the fact that these pupils have been a select body with a special interest in mathematics. It may be due to the fact that the standards of the two colleges are different.

Composite charts 107 and 108 represent pupils from 23 different high schools, who go on to college. The total retention in the subjects of English on the basis of absolute marks is 53.30 per cent.[1] The exact retention for high school No. 1 and college No. 1 between Freshman high-school English and Freshman college English is 77.52 per cent; between the three years' average of high-school English and the Freshman college English, 88.76; between the three years' average of high school and the four years' average of college English, 87.93;

[1] The exact retention for each division is as follows: 45.91 per cent for division I; 28.57 for division II; and 71.73 for division III. Retention here is based upon the number of pupils in the original groups respectively.

for high school No. 5 and college No. 2, between Freshman high-school English and Freshman college English, 64.81; between Sophomore high-school and Freshman college English, 74.07; between the four years' average of high-school and Freshman college English, 75.92; between Freshman-Sophomore mathematics and Freshman college mathematics, 60 per cent.

The result of the comparisons made between high school No. 1 and college No. 1 in a single subject, English, expressed in terms of the average of the percentage of the pupils in the high and low tertiles who remain in the upper and lower halves respectively in the college groups is a retention of over 80 per cent. The result of the comparisons made between high school No. 5 and college No. 2 shows a lower retention, namely, somewhere near 70 per cent. These results will be supplemented in sec. V.

From the above results it may be concluded that the retention between high school and college is between 75 and 80 per cent.

Graph showing distribution of marks in English, High School No. 1.

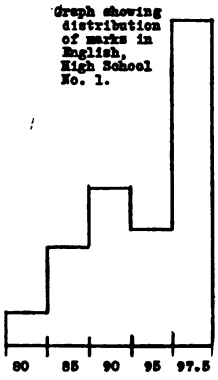


Chart No.89. Average of 2 semesters in English of 266 pupils, High School No. 1.

89 pupils.					88 pupils.				89 pupils.				
			219	134	25	141	84	181	161	86	46	21	1
	140	61	220	143	42	203	85	182	162	89	47	22	2
	142	66	221	144	78	204	87	183	163	90	48	23	3
	147	68	222	145	73	205	62	184	164	91	49	26	4
	149	71	227	146	77	206	70	185	165	94	50	27	5
	153	74	229	148	83	211	76	186	166	97	51	28	6
	154	78	230	196	88	212	79	187	167	103	62	29	7
41	156	80	234	199	92	215	81	188	168	110	63	30	8
120	201	93	237	200	95	223	84	189	169	116	66	32	9
124	202	109	239	201	96	224	87	190	170	119	68	33	10
135	204	111	240	202	99	225	98	191	171	125	69	34	11
161	206	115	242	207	100	226	101	192	172	126	60	35	12
167	206	118	244	209	104	228	102	193	173	128	65	36	13
206	207	122	245	210	112	231	105	194	174	132	66	37	14
208	209	135	246	213	117	232	106	195	175	150	68	38	15
209	210	136	247	214	123	233	107	196	176	152	67	39	16
212	211	137	248	216	127	236	108	197	177	156	69	40	17
265	263	138	249	217	129	236	114	238	178	158	76	43	18
266	264	139	250	218	131	241	116	242	179	159	82	44	19
80		85		90		93				97.5			

Graph showing distribution of marks in English of same 266 students, College No. 1.

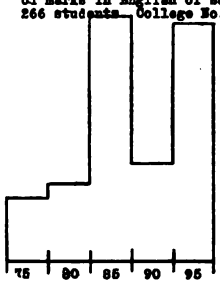


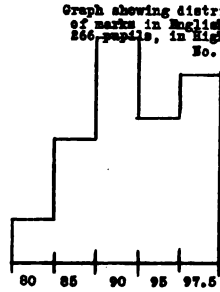
Chart No. 90. Fresh. English of the same 266 students, College No. 1.

61%					31%				86%				
				230- 142*	112	80-	24	128*	3*	187	143-		
				232 166*	113-	83	28	135-	18*	188	146-	59*	22* 1*
				233 167*	114	84	27*	146-	20*	189	152*	62	26* 2*
		200-		234- 172	116	86*	35*	154-	21*	190	157-	63*	28* 4*
		203	66-	235 173	116*	87	37*	180	23*	192	159*	77	29* 5*
		208	67*	236 175	120-	88	38*	186	33*	193	160*	79	30* 6*
136-	41-	211	68-	241 178	121	89*	39*	194	34*	195	163*	82*	31 7*
139-	71-	218-	70	246- 181	122-	91*	42	205	43*	196	164*	90*	32* 8
149-	76	220-	78-	248- 185	123	92	46*	212	46*	197	165*	101	36* 9*
166-	96	228-	100	250- 191	126*	94*	58*	225	49*	201-	168*	102	40* 10*
198-	99	225	108	261- 199-	134-	96	60*	226	50*	208-	169*	105	44* 11*
206-	117	229-	137-	263- 207-	136-	97*	61-	237-	54	204	170	110*	46* 12*
217-	124-	236	148-	264- 210-	145-	98	65*	239-	57	209-	174	118-	47* 15*
219-	127-	242-	144-	256- 215-	150*	104	69*	240-	64*	216-	176	119*	51* 14*
227-	129-	245-	147-	263- 214-	151-	106	72	243	81	228	179	126*	68* 15*
258-	130	256-	156*	264- 218	153-	107	73	247-	86*	231	182	132*	68* 16*
260-	131-	259-	171	266- 221-	155*	109-	74-	249-	93-	244-	183	140-	85 17*
261-	133-	260-	177	266- 224	161*	111-	75*	257-	103*	262-	184	141	86* 19
75		80			85			90				95	

Chart No. 91. Average of 3 years in English for each of the 266 pupils, High School No. 1.

89 pupils				88 pupils				89 pupils				
149								152	36	1		
153	61							156	37	2		
154	68	210	148					159	38	3		
156	71	211	145	101	25			161	39	4		
206	74	218	146	105	42			164	40	5		
215	77	217	147	106	55	182	62	20	166	43	6	
214	78	220	148	107	57	184	65	21	166	44	7	
41 218	80	221	157	108	60	191	67	22	167	45	8	
72 219	83	227	158	114	64	204	75	24	168	47	9	
111 222	88	230	172	116	66	205	79	26	169	48	10	
113 223	95	234	173	117	70	209	81	28	170	50	11	
122 224	99	235	177	118	73	215	102	29	183	52	12	
124 229	100	236	180	121	76	216	115	30	185	53	13	
133 245	104	237	181	123	84	225	150	31	187	63	14	
139 250	109	239	186	125	86	226	160	33	188	69	15	
142 251	112	240	196	126	87	228	162	34	189	82	16	
151 253	120	241	199	129	89	231	163	46	190	85	17	
252 254	127	242	200	130	91	232	171	54	192	90	18	
256 255	136	244	201	131	92	233	174	51	193	97	19	
259 256	137	246	202	132	93	236	175	49	194	103	23	
261 257	138	248	203	134	94	243	176	56	195	110	27	
266 260	140	262	207	135	96	247	178	58	196	119	32	
266 264	144	263	208	141	98	249	179	59	197	128	36	
80	85		90			93				97.5		

Graph showing distribution of marks in English of 266 pupils, in High School No. 1.



Graph showing distribution of marks in English of same 866 students, College No. 1.
Chart No. 88. Fresh. English of the same 866 students, College No. 1.
Distribution of Marks in Chart
Chart No.89' average of English of 86 graduates (College No.1
Distribution of Marks in chart
Chart No.91' average of 3 years English of 86 pupils, H.S.No.1
29 pupils
28 pupils
29 pupils
Distribution of Marks in Chart

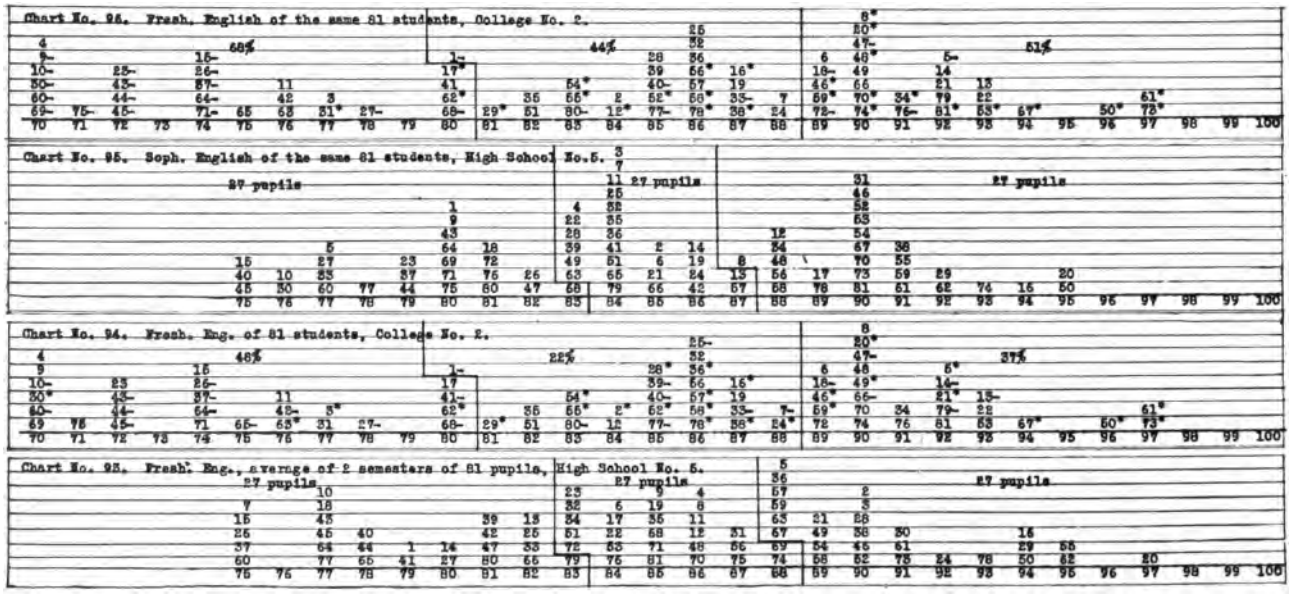


Chart No. 96. Fresh. English of the same 81 students, College No. 2.
68%
44%
51%
Chart No. 95. Soph. English of the same 81 students, High School No. 5.
27 pupils
27 pupils
27 pupils
Chart No. 94. Fresh. Eng. of 81 students, College No. 2.
46%
22%
37%
Chart No. 93. Fresh. Eng., average of 2 semesters of 81 pupils, High School No. 5.
27 pupils
27 pupils
27 pupils

Chart No. 100. Average of 2 semesters of Fresh. Math. of the same 60 students, College No. 2.

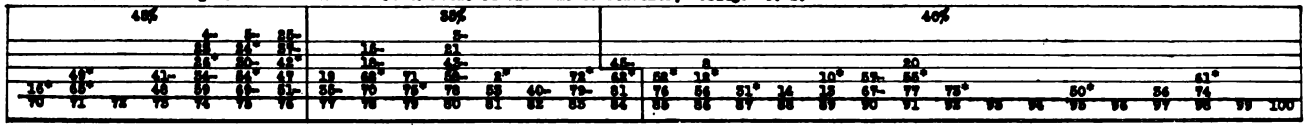


Chart No. 99. Average of Fresh.& Soph. Math. of 60 pupils (out of 81 in English), High School No. 5.

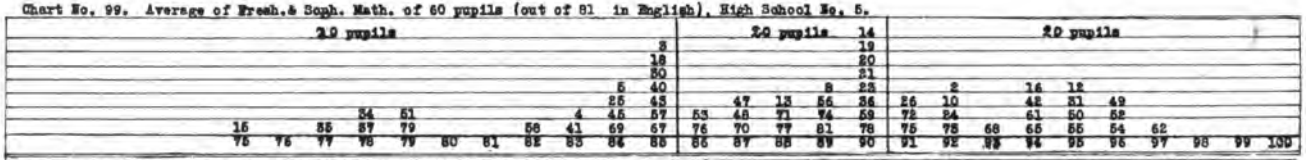


Chart No. 98. Fresh. Eng. of same 81 students, College No. 2.

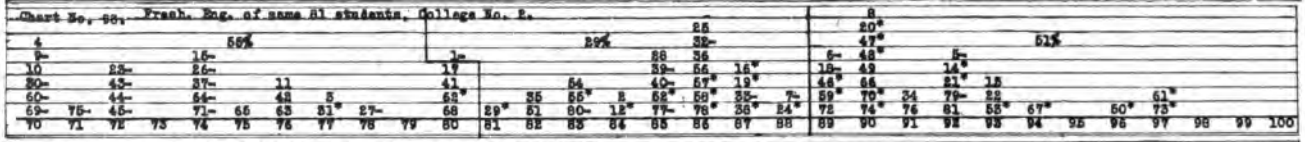


Chart No. 97. Average of 4 years of English of the same 81 pupils, High School No. 5.

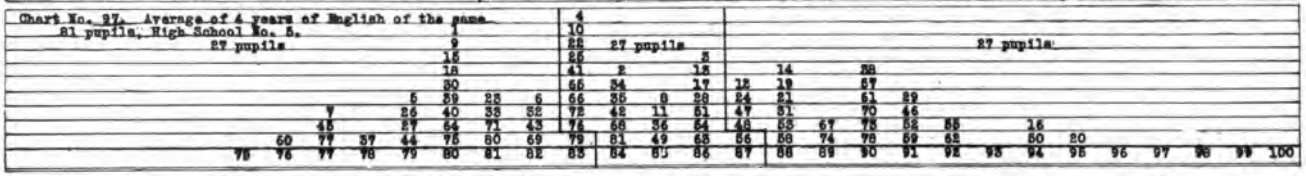


Chart No. 101. Fresh. Eng. of 84 pupils, High School No. 7.

		2	1
		3	4
	49	29	5
	50	30	6
	54	31	7
	55	32	8
	56	33	9
	57	34	10
	58	35	11
	59	36	12
	60	37	13
	61	38	14
	63	39	15
	65	40	16
	66	41	17
	67	42	18
	68	43	19
	69	44	20
62	70	45	21
78	71	46	22
79	72	47	23
80	73	48	24
81	74	51	25
82	75	52	26
83	76	53	27
84	77	64	28
3	2	1	

Distribution of Marks in Chart No. 101.

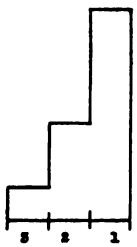
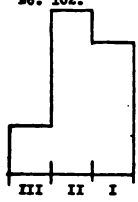


Chart No. 102. Fresh. Eng. of the same 84 pupils, College No. 1.

	47*	18*		
	49	46*		
	50	20*		
	51*	21*		
	55*	22*	2*	1*
	56	23*	4*	2*
	58	25*	6*	3*
	59	27*	8*	4*
24*	60	28*	35*	5*
26*	61	29*	36*	10*
28*	65	30*	38*	11*
57	68	31*	39*	12*
62-	69	32*	48*	13*
66	71	37*	54	14*
67	74	40*	55	16*
70	75	41*	63	17*
73	76	42*	64*	18*
82-	77	43*	72	19*
83-	79-	44*	78-	33*
84-	81-	45*	80-	34*
III	II		I	

Distribution of Marks in Chart No. 102.



Distribution of Marks in Chart No. 103.

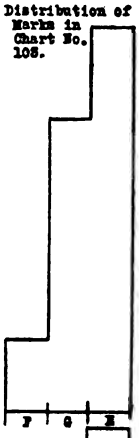


Chart No. 103. Fresh. Math. of 184 pupils, High School No. 6.

	143	118		75	49	23	
	144	119		76	50	24	
	145	120		77	51	25	
	146	121		78	52	26	1
	147	122		79	53	27	2
	148	123	41	80	54	28	3
	149	124	55	81	56	29	4
	150	125	100	82	57	30	5
168	151	126	101	83	58	31	6
169	152	127	102	84	59	32	7
170	153	128	103	85	60	33	8
171	154	129	104	86	61	34	9
172	156	130	105	87	62	35	10
173	156	131	106	88	63	36	11
174	157	132	107	89	64	37	12
175	158	133	108	90	65	38	13
176	159	134	109	91	66	39	14
177	160	135	110	92	67	40	15
178	161	136	111	93	68	42	16
179	162	137	112	94	69	43	17
180	163	138	113	95	70	44	18
181	164	139	114	96	71	45	19
182	165	140	115	97	72	46	20
183	166	141	116	98	73	47	21
184	167	142	117	99	74	48	22
F		G			E		

Distribution of Marks in Chart No. 104.

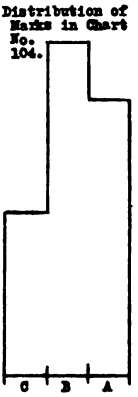


Chart No. 104. Fresh. Math. of the same 184 pupils, College No. 3.

		7*	4*				
	10*	13*	14*				
72*	70*	125	15*	81*	31*		
77*	73*	130	25*	86*	32*		
85*	82*	132	37*	87*	33*		
85*	84*	133	38*	89*	35*		
93*	88*	134	39*	90*	36*		
102	94*	136	44*	91*	40*		
104	103	140	45*	92*	42*		
109	105	141	46*	95*	43*		
153	110	142	48*	96*	49*		
154	111	145	53*	98*	50*	1*	
156	112	147	54*	99*	51*	3*	
159	113	148	57*	101	52*	6*	
162	114	150	62*	108	58*	6*	
163	115	152	66*	123	59*	16*	
170-	118	155	69*	131	60*	17*	
171-	120	160	78*	136	61*	18*	
174-	122	161	97*	137	63*	19*	
176-	126	164	100	143	64*	21*	
176-	127	165	106	144	66*	22*	
177-	128	166	107	146	71*	23*	
179-	129	167	116	151	74*	26*	
180-	138	169-	117	156	75*	27*	
182-	139	172-	119	157	76*	28*	
183-	149	173-	121	168-	79*	29*	
184-	153	181-	124	176-	80*	30*	
C		B			A		

Distribution of Marks in Chart No. 105.

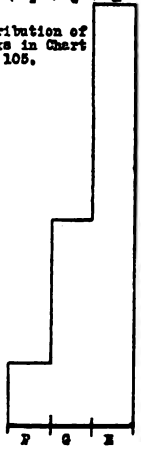


Chart No. 105. Fresh. Eng. of 165 pupils, High School No. 6.

		77				
	124		78	52	26	1
	125	27	79	53	28	2
	126	81	80	54	29	3
	127	82	86	55	30	4
	128	83	87	56	31	5
	129	84	88	57	32	6
	130	85	91	58	33	7
	131	89	92	59	34	8
	133	90	93	60	35	9
	134	94	95	61	36	10
119	135	96	98	62	37	11
140	136	97	100	63	38	12
141	137	99	101	64	39	13
144	138	102	103	65	40	14
156	139	107	104	66	41	15
156	142	109	105	67	42	16
157	146	110	106	68	43	17
158	147	111	108	69	44	18
159	148	112	113	70	46	19
160	149	114	115	71	46	20
161	150	117	116	72	47	21
162	151	118	121	73	48	22
163	152	120	132	74	49	23
164	153	122	143	75	50	24
165	154	123	145	76	51	25
F		G		E		

Distribution of Marks in Chart No. 106.

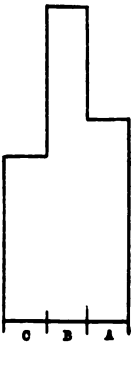


Chart No. 106. Fresh. Eng. of the same 165 pupils, College No. 5.

			22*			
	118	70*	23*	30*		
	120	71*	24*	31*	1*	
	121*	72*	25*	32*	2*	
	123	73*	26*	33*	3*	
	125	74*	35*	34*	4*	
112	128	75*	37*	36*	5*	
114	129	81	38*	39*	6*	
124	133	82	41*	40*	7*	
126	134	84	42*	44*	8*	
127	136	86*	43*	47*	9*	
130	140-	88*	45*	49*	10*	
131	141-	91*	46*	52*	11*	
135	142	94	48*	58*	12*	
136	145*	95*	51*	83	13*	
137	146	97	53*	85	14*	
139	148	98*	54*	86*	15*	
145*	149	100*	55*	93*	16*	
151	150	101*	59*	96	17*	
153	152	102*	60*	115*	18*	
155-	154	103*	61*	116*	19*	
157-	106*	156-	104*	64*	119-	20*
158-	107	159-	105*	65*	122	21*
161-	108*	160-	110	60*	132*	26*
163-	109	162-	113*	67*	144-	27
164-	111	165-	117	69*	147	29*
C		B			A	

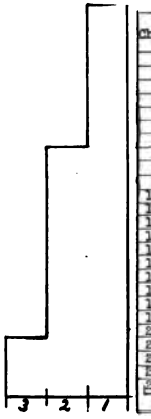


Chart No. 107. Fresh. Eng. of 272 pupils from 23 different high schools.

	195	145	85	16
	196	146	86	17
24	197	166	87	18
42	198	157	88	19
77	202	158	108	20
89	212	159	109	21
90	222	160	110	22
91	223	161	111	23
119	224	162	112	30
120	230	163	116	31
123	231	167	117	38
139	232	168	118	39
147	233	169	129	40
164	234	170	130	41
165	240	171	131	51
176	246	172	134	52
182	247	173	135	62
183	254	174	136	63
225	255	175	137	64
248	265	179	138	66
256	272	180	142	75
257	273	181	143	76
275	274	194	144	84
3		2		

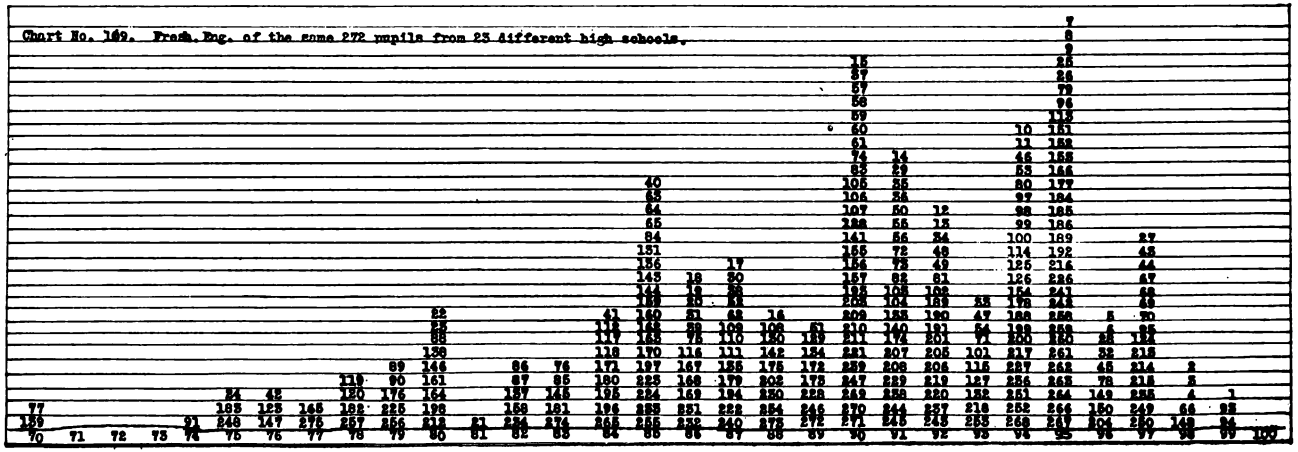
236	198	126	74	36	
237	199	127	78	37	
238	200	128	79	43	
239	201	132	80	44	1
241	203	135	81	45	2
242	204	140	82	46	3
243	205	141	83	47	4
244	206	148	93	48	5
245	207	149	94	49	6
249	208	150	95	50	7
260	209	161	96	53	8
261	210	162	97	54	9
262	211	153	98	55	10
263	213	154	99	56	11
266	214	155	100	57	12
259	215	166	101	58	13
260	216	177	102	59	14
261	217	178	103	60	15
262	218	184	104	61	25
263	219	185	105	66	26
264	220	186	106	67	27
266	221	187	107	68	28
267	226	188	113	69	29
268	227	189	114	70	32
269	228	190	115	71	33
270	229	191	124	72	34
271	235	192	126	73	35
		1			

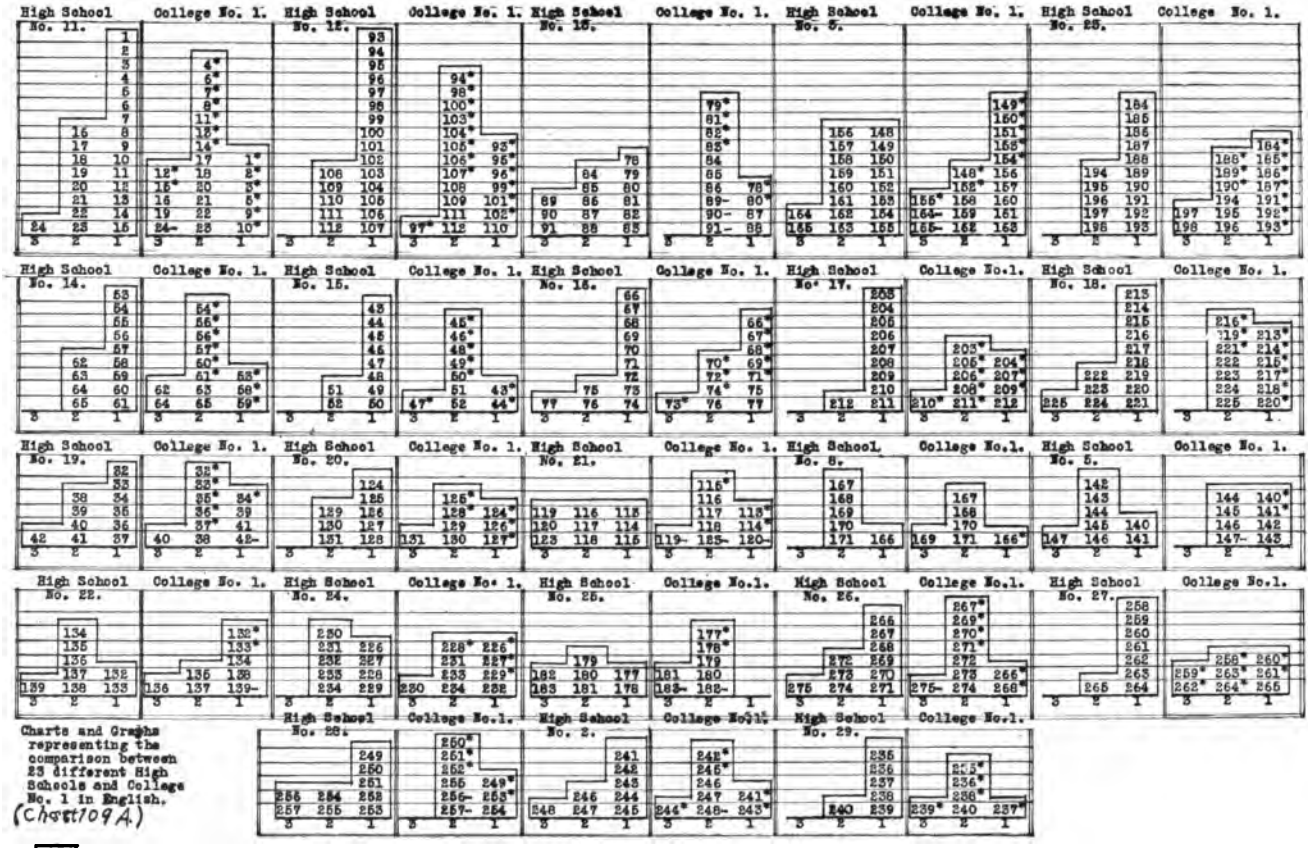
Chart No. 108. Fresh. Eng. in College No. 1, of same 272 students.

	245*	205*	169	111	76	38	4*
	246	206*	162	112	79*	42*	6*
	247	208*	167	116*	81*	45*	7*
155*		248	216*	168	116	82*	46*	8*
164–	12	250*	219*	170	117	84	48*	11*
165–	15*	251*	221*	171	118	85	49*	12*
169	16	252*	222	174	123	86	50*	14*
173	19	255	224	176	125*	89	51	17
181	24–	256	225	177*	128*	90	52	18
183–	31	257	228*	178*	129	91	54*	20
197	36*	258*	231	179	130	94*	55*	21
198	40	263*	233	180	135	98*	56*	23
201*	47*	264*	234	182	137	100*	57*	26*
202	62	267*	235*	188*	144	102*	60*	28*
210*	64	269	236*	189*	145	104*	61*	29*
223	73*	270*	238*	190*	146	105*	63	30
230	97*	271*	239*	194	147	106*	65	32*
259*	119–	272	240	195	148*	107*	70*	33*
262*	131	273	242*	196	152*	108	72*	35*
275–	136	274	244*	203*	158	109	74*	37*
3			2				

214*	161	124*	68*		
216*	163	126*	69*	1*	
217*	166*	127*	71*	2*	
218*	172	132*	76	8*	
220*	175	133*	77	9*	
226*	184*	134	78*	9*	
227*	186*	136	80*	10*	
229*	186*	139	82*	22	
232	187*	140*	87	24*	
237*	191*	141*	88	27*	
241*	192*	142	92*	34*	
245	193*	148	96*	39	
249*	199*	149*	96*	41	
253*	200*	150*	99*	42	
254	204*	151*	101*	44*	
260*	207*	152*	102*	45*	
261*	209*	154*	110	50*	
265	211*	156	113*	59*	
266*	212	157	114*	66*	
268*	213*	160	120	67*	
1					

Chart No. 109. Fresh. Eng. of the same 272 pupils from 23 different high schools.





Charts and Graphs representing the comparison between 23 different High Schools and College No. 1 in English.
(Chart 109A)

SEC. V. COMPARISON BETWEEN THE RELATIVE STANDING OF THE SAME PUPILS IN THE GRAMMAR SCHOOL, HIGH SCHOOL, AND COLLEGE

The purpose of the previous comparisons has been to try to determine the existing relation between the grammar schools and high schools, and also between the high schools and colleges, but not necessarily dealing with the same pupils throughout the three institutions. The purpose of this last section of chap. iii is to try to determine the relation of the grammar school to the high school and the relation of the high school to the college on the basis of the marks made by the *same* pupils who have attended all three of these institutions of learning.

In the former sections naturally there were more different pupils involved, because it is very difficult to find reliable records of large numbers of pupils who have attended the three institutions.[1]

In order to make such a comparison as this in sec. V it is necessary to have available records covering at least the eighth grade, the four years of high school, and the first year of college work. But it is easy to see what a tedious process it is to gather much of this sort of reliable data when it is remembered that one-half of the grammar-school pupils drop out somewhere near the completion of the fifth grade, and that not more than 5 per cent, approximately, go on to high school, and not more than 1 per cent enter college. So far as the writer is aware, the collection of the marks of pupils attending the three institutions has not previously been done in an extensive way. And it will need to be carried much farther in order to justify wider conclusions.[2]

While this section also involves a separate comparison between the grammar school and high school, and between the high school and college, yet it is not a mere duplication of the former sections. It will be of some interest to see whether the percentage of retention for the pupils who attend all three of the institutions is similar to the results in the former sections, although the largest group of pupils used in sec.

[1] The difficulties in securing reliable data for such a comparison as this are obvious. Many pupils who graduate from high school have completed their eighth-grade work in cities other than the one in which the high-school work has been done. Some pupils have come in from the rural sections where records often are poorly kept. Some pupils when partly through the high school either move to another city or drop out temporarily and consequently records are not continuous. Many high-school pupils who are reported by principals as entering college leave before any record worth noting is made. These are only a few of the veritable difficulties met with in the actual collection of marks.

[2] High schools Nos. 5, 1, and 6 have furnished the majority of the records for this triple-institution comparison.

V in comparing the grammar and high school has not been previously used in this thesis. Many of the pupils already included in the grammar-school discussions never went on to college.

The charts, tables, graphs, and diagrams used in this section are similar to those used in earlier sections, and so will need no further explanation at this juncture. The diagram used is probably the main original supplement to the graphic representation by the use of charts.

Since it is not possible to compare more than two subjects or two institutions at any one time by the use of the charted marks of pupils, it was necessary first to compare the marks of the grammar-school pupils with those of the high-school pupils, and then to compare the marks of these same pupils in the college with their marks received in the high school.

In order to read charts 110, 111, 112, then, first it is necessary to compare chart 110 with chart 111. This will show how the pupils have maintained their relative positions in the groups, or how they have shifted their relative positions in the high school. The starred numbers in chart 111 indicate that originally the pupils represented by these starred numbers were located within the high group of the grammar-school work in eighth-grade English. The numbers accompanied by the minus characters indicate that these pupils originally began their grammar-school work with a position in the low group. The plain numbers in chart 111 represent pupils who have come from the middle group of the grammar school.

Ignoring, then, in the second instance the stars and minuses in chart 111, it may be read again in a similar fashion in relation to chart 112, which shows the positions of pupils in the college work who have come from the high school.

The tendencies in distribution of the groups which have appeared in other sections relative to grammar school No. 5′, high school No. 5, and college No. 2 may be seen in these later comparisons in charts 110–15. In 110 or 113 the marks of the grammar-school pupils are most numerous between 86 and 95 per cent, while the marks of the same high-school pupils are most numerous between 75 and 90, and 78 and 89, respectively, in charts 111 and 114, while the marks of these same pupils are bimodally divided in college No. 2, as is indicated in either chart 112, or 115. Is this amount of zigzag shifting within precisely the same group of pupils as they pass from one institution to another justifiable? Or is it probable that if the institutions should agree more definitely upon

the rating of students among themselves and between each other the shifting of groups of this kind would be quite materially reduced?

When the sixth and seventh grades of school No. 1 are included in charts 116, 119, 123, 126 the tendency of the upward skew occurs in a similar fashion to that pointed out in previous sections where only the eighth-grade work was considered, in other schools.[1]

On the other hand, as we have seen previously with respect to grammar school No. 6 in charts 60 and 64, so here again we may observe a tendency toward a normal distribution curve, as is evidenced by such charts as 129, 132, 135, 141, 148.

Charts 120 and 124 are both skewed more toward the top than is 122. This likely shows that there is some irregularity in the standards used by teachers. Otherwise chart 124 would be more like chart 122 than like chart 120. Another explanation may be offered, namely, that a select body of pupils is represented in 124, since chart 125 showed that as a group they have held their place quite well in college.

Graphs 116, 117, 118 indicate as well as graphs 119, 121, and 122 that the grouping is more similar between the high school and college than the grouping between the grammar school and high school, and a similar conclusion may be made regarding the charts 123–28.

However, the graphs representing the sixth-, seventh-, and eighth-grade English of 50 pupils, and an average of their four years' English in high school together with an average of their three years' work in English in college, as shown respectively in charts 123, 124, 125, are enough alike to justify the assertion that the standards used in grammar school No. 1′, high school No. 1, and college No. 1 are in the main somewhat similar. In a modified form this statement will hold also with respect to charts 126, 127, 128.

The 74 pupils in mathematics represented by charts 132, 133, 134 are part of the group of 90 students in English represented by charts 129, 130, 131. There is a general corresponding similarity in the charts for the respective institutions. But, is the almost equal distribution of marks in chart 134 justifiable?

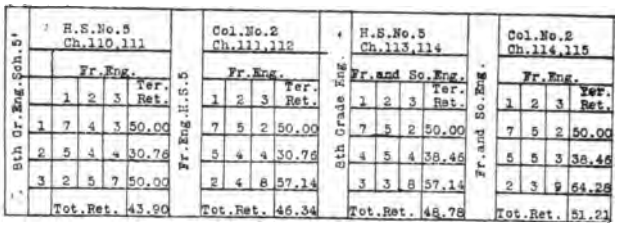
Charts 129–40 indicate that the grouping of pupils is more alike between grammar school No. 6′ and college No. 3 than between high

[1] The system of grading in grammar school No. 1 in the records used was whole numbers and fractions, as, for example, 1, 1½, 1¼, 1⅛, 2, 2½, 3, etc. .1 is used to represent 95 per cent; 1½, 90; 2, 85; 2½, 80; and 3, 75 per cent for purposes of charting. As before noted this is not an absolutely accurate method, for 1, or 95 per cent, really stands for something in the range of 95 per cent. This translation was made into percentages because some of the later marks had been recorded only in integral numbers.

school No. 6 and the college.[1] The grammar school has a more normal distribution of marks than the college, particularly in the subjects of mathematics and history.

Judging from charts 143 or 145 or 147 the distribution either in chart 142 or 146 is more justifiable than that of 144, for the pupils in 145 do not maintain their position so well as in 142 or 146 when they go on to college. Furthermore, the distribution in 142 and 146 corresponds more to 141 than does that in 144.

Chart 141 represents 35 pupils in eighth-grade English from grammar school No. 6′ who go on to college.[2] Charts 141, 142, 143 indicate a general similarity of groupings used in the respective institutions just



8th Gr. Eng. Sch. 5′	H.S. No. 5 Ch. 110, 111 Fr. Eng.			
	1	2	3	Ter. Ret.
1	7	4	3	50.00
2	5	4	4	30.76
3	2	5	7	50.00
Tot. Ret.				43.90

Fr. Eng. H.S. 5	Col. No. 2 Ch. 111, 112 Fr. Eng.			
	1	2	3	Ter. Ret.
7	5	2		50.00
5	4	4		30.76
2	4	8		57.14
Tot. Ret.				46.34

8th Grade Eng.	H.S. No. 5 Ch. 113, 114 Fr. and So. Eng.			
	1	2	3	Ter. Ret.
7	5	2		50.00
4	5	4		38.46
3	3	8		57.14
Tot. Ret.				48.78

Fr. and So. Eng.	Col. No. 2 Ch. 114, 115 Fr. Eng.			
	1	2	3	Ter. Ret.
7	5	2		50.00
5	5	3		38.46
2	3	9		64.28
Tot. Ret.				51.21

TABLE X

Showing the retention in grammar school No. 5′, high school No. 5, and college No. 2.

as 141, 144, 145 and 141, 146, 147 and 148, 149, 150 do when compared. But in the majority of cases there is a closer likeness in the grouping between grammar school No. 6′ and high school No. 6 than between high school No. 6 and college No. 1, and this may be due in part to the fact that the college is not located in the same city and consequently is not so likely to dominate over the high school in setting standards.

The summaries of the retentions are presented in the tables that follow. Table X indicates the results of the comparisons made between the marks of 41 pupils who attended the three institutions, namely, grammar school No. 5′, high school No. 5′, and college No. 5. The retention for charts 111 and 112 is higher than that for charts 110 and 111, and the retention for charts 114 and 115 is higher than that for charts 113 and 114 in the subject of English. According to this result the relation between high school No. 5 and college No. 2 is closer than the relation between grammar school No. 5′ and high school No. 5.

[1] This college is located in the same city with the grammar school and high school.

[2] These pupils are numbered in order of their standing determined from the exponents accompanying the marks.

The retention for the middle third and for the upper third is, however, the same for each institution. The retentions here correspond rather closely to the comparisons made between high school No. 5 and college No. 2 in the larger group of the earlier section.

The general result of the comparison made between grammar school No. 1′, high school No. 1, and college No. 1 may be seen in table XI. The retentions both between the grammar school and high school and between the high school and college are considerably higher than was

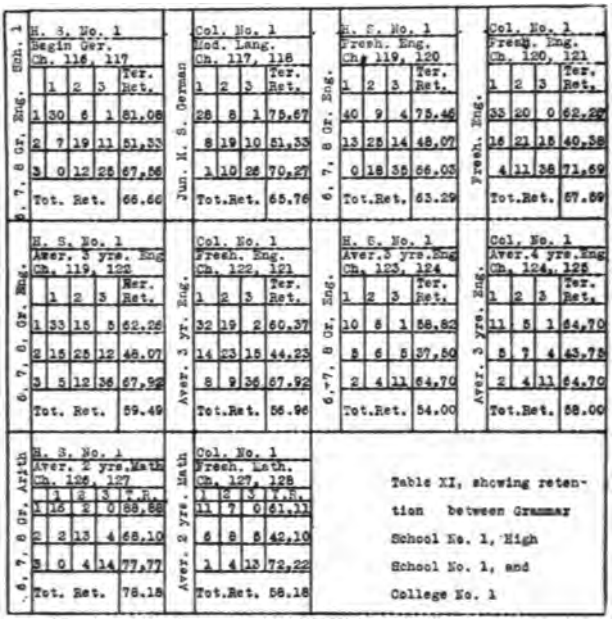


Table XI, showing retention between Grammar School No. 1, High School No. 1, and College No. 1

found to be the case in grammar school No. 5′, high school No. 5, and college No. 2. Part of this may be due to the necessity of charting on the three-estimate basis rather than on a wider per-cent basis, but it is no doubt safe to assume upon the basis of the results as they appear in table XI that the correlation between the primary, secondary, and higher institutions is the closer in the latter comparison.[1]

[1] The high-school marks used were 1, 2, 3. In this comparison 1 equals 97.5; 2 equals 90; and 3 equals 80; an average of 2, 1 equals 93¾; an average of 1, 3 equals 88.75; an average of 2, 3 equals 85. For convenience, 93¾ is charted as 95, and 88.75 as 90. In the college marks of 1, 2, 3, number 1 is used to indicate 95; number 2, 85; number 3, 75; an average of 1, 2, 90; an average of 1, 3, 85; an average of 2, 3, 80.

The triple-arranged columns opposite the numbers of the individuals show whether a pupil has shifted or maintained his or her position in passing from one institution to another. For example, 27, 17, and 16 did not shift out of the high group; 4, 14, 19, and 28 maintained their positions in passing to the high school, but 4 and 14 dropped down to the second group in the college, while 19 and 28 dropped to the third group. By a glance at the table as a whole it may be seen that there are comparatively few third-group pupils who have risen to the high tertile; comparatively few first-group pupils fallen to the low tertile; in the middle tertile there is more of a mixture and shift ng of positions indicated.

Pupil	Low Tertile			Pupil	Mid. Tertile			Pupil	High Tertile		
5	3	3	3	10	2	2	2	27	1	1	1
30	3	3	3	41	2	2	2	17	1	1	1
8	3	3	3	12	2	2	2	16	1	1	1
22	3	3	3	23	2	2	3	4	1	1	2
3	3	3	2	13	2	1	1	14	1	1	2
40	3	3	2	34	2	1	1	19	1	1	3
9	3	2	1	20	2	1	2	28	1	1	3
24	3	2	3	25	2	1	2	31	1	2	1
26	3	2	3	35	2	1	2	18	1	2	1
32	3	2	3	2	2	3	3	38	1	2	1
37	3	2	1	6	2	3	3	29	1	2	3
11	3	2	1	21	2	3	3	36	1	3	1
1	3	1	1	7	2	3	3	33	1	3	2
39	3	1	1					15	1	3	2

TABLE B*

Showing the relative standing of each individual in grammar school No. 5*, high school No. 5, and college No. 1.

* The numbers used for pupils in table B and table C are the same numbers given miscellaneously to pupils in the larger previous groups. This explains the fact that number 2 above and number 3 in table C, for example, are recorded in the second group of the grammar school, etc.

This triple-table arrangement has been here suggested because it is applicable to small as well as to large groups. In the above instance the number is somewhat small. The second column of the table in the high tertile indicates that seven pupils held the same group position in the high school which they held in the grammar school. This same fact is indicated in diagram III by the number 7 in the first tertile of the high-school group. Four pupils in diagram III, as indicated by the second column of the middle tertile of table B, held the same relative position in the high school which they held in the grammar school. In this manner the shifting or retention of each individual pupil may be traced out by following the lines in the diagram.

From this table it is easy to construct the diagram which traces the groups as a whole. Both the triple table and the diagram show that many pupils tend to keep within the same groups, respectively, as they pass through the different institutions. Out of the 14 pupils in diagram III who appear in the high third of the high school 7 have come from

the high third of the grammar school, 5 from the middle group, and 2 from the lower group. There are 3 pupils in the high group who go straight through within the same group, 3 in the middle group, and 4 in the lower group. A later diagram for another school will show a higher retention than this.

In further detail it may be pointed out that the retention between the grammar-school English and the high-school German is a little higher than is the retention between the grammar-school English and the high-school English. The higher retention between grammar-school English and Freshman Latin than that between grammar-school and high-school English has been pointed out earlier. The above higher correlation between the English and German might be accounted for by the fact that the German was taken in the Junior year while the English was taken in the Freshman year, at a time then the pupils were more immature. But since the retention for charts 119, 122 is lower where there is an average of three years of high-school English considered, it is likely that the correlation between the English and German is better than the English and English in the two institutions, namely, the elementary school and high school.

The fact that the retention is higher between charts 126 and 127 in the subject of mathematics than it is between charts 123 and 124 in the subject of English may be due to the fact that a different standard is being used in the high-school English than in the subject of mathematics. For when the pupils go on to college the retention as shown between charts 124 and 125 is about the same as the retention between charts 127 and 128.

With the exception of the relation between charts 123 and 124, table XI shows that the retention is higher between the grammar school and high school than it is between the high school and college. But the relation between high school No. 1 and college No. 1 is closer according to the tertile method than was the relation between high school No. 5 and college No. 2. This higher retention in school No. 1 may be the result of the influence of the college. And since most of the pupils who go to college do not need to change their home environment in this instance there is likely to be less of a break between the earlier school work and their college work.

Table C may be read in the same manner as table B. When the second column of any of the three tertile groups is read it shows the group to which a pupil belongs in the high school. For example, 40 pupils were retained in the first group of the high school, as the second

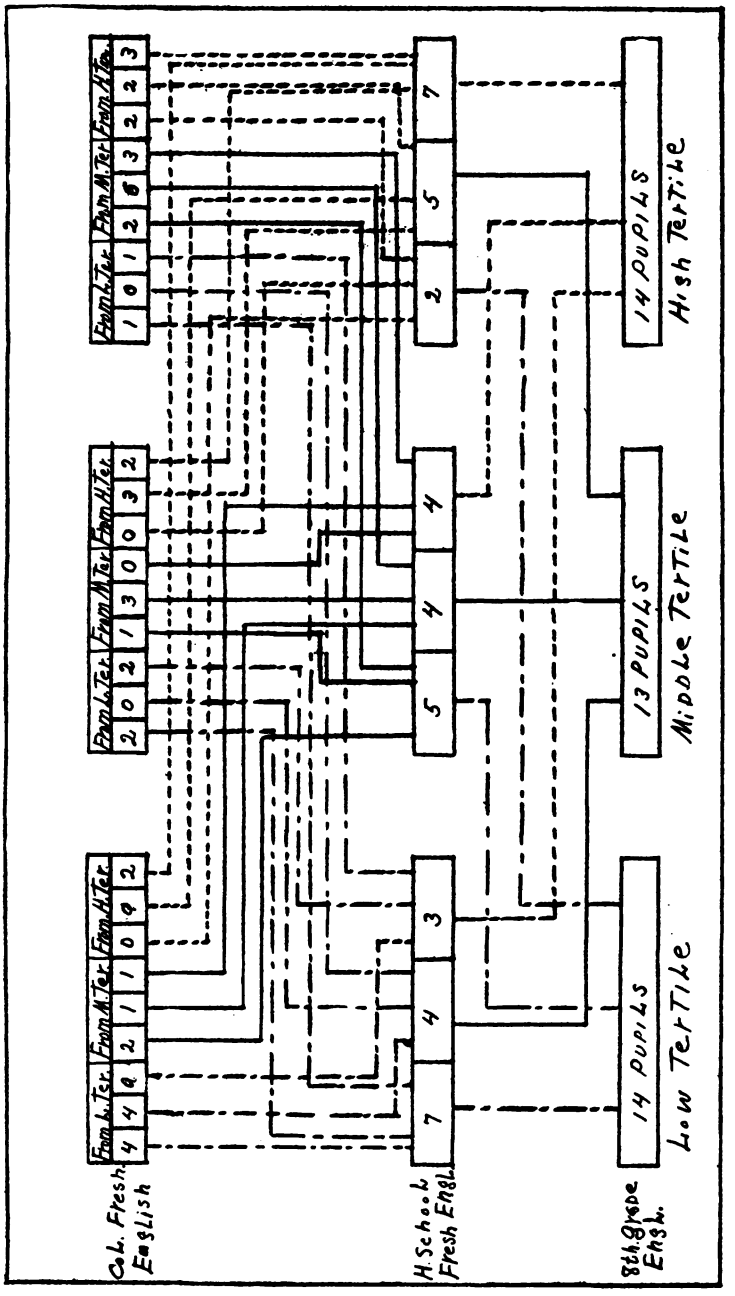


DIAGRAM III

Showing the group retention of pupils in Charts 110, 111, 112, grammar school, high school, college

column of the high tertile shows, 25 in the middle, as the second column of the middle tertile shows, and 35 in the lower, as the second column of the low tertile shows. By reading the three columns simultaneously, under any one tertile, it shows how many pupils were retained throughout the three institutions, which in this case is 28 in the high, 10 in the middle, and 25 in the lower groups, respectively.

Pupils	Low Tertile			Pupils	Mid. Tertile			Pupils	High Tertile		
107	3	3	3	81	2	2	2	1	1	1	1
156	3	3	3	84	2	2	2	2	1	1	1
41	3	3	3	85	2	2	2	4	1	1	1
127	3	3	3	86	2	2	2	5	1	1	1
131	3	3	3	87	2	2	2	6	1	1	1
139	3	3	3	24	2	2	2	7	1	1	1
142	3	3	3	89	2	2	2	8	1	1	1
144	3	3	3	75	2	2	2	9	1	1	1
145	3	3	3	94	2	2	2	10	1	1	1
147	3	3	3	54	2	2	2	11	1	1	1
149	3	3	3	82	2	2	1	12	1	1	1
151	3	3	3	31	2	2	1	13	1	1	1
153	3	3	3	56	2	2	1	14	1	1	1
114	3	3	3	62	2	2	1	15	1	1	1
117	3	3	3	77	2	2	1	16	1	1	1
120	3	3	3	79	2	2	1	17	1	1	1
129	3	3	3	90	2	2	1	19	1	1	1
133	3	3	3	102	2	2	1	22	1	1	1
134	3	3	3	105	2	2	1	26	1	1	1
136	3	3	3	119	2	2	1	29	1	1	1
137	3	3	3	97	2	2	3	32	1	1	1
138	3	3	3	106	2	2	3	40	1	1	1
95	3	3	3	115	2	2	3	44	1	1	1
96	3	3	3	116	2	2	3	48	1	1	1
100	3	3	3	121	2	2	3	52	1	1	1
154	3	3	2	28	2	1	1	56	1	1	1
157	3	3	2	30	2	1	1	59	1	1	1
148	3	3	2	36	2	1	1	63	1	1	1
74	3	3	2	47	2	1	1	18	1	1	2
88	3	3	2	81	2	1	1	20	1	1	2
138	3	3	2	3	2	1	2	21	1	1	2
143	3	3	1	35	2	1	2	23	1	1	2
118	3	3	1	34	2	1	2	27	1	1	2
140	3	3	1	37	2	1	2	33	1	1	2
146	3	3	1	43	2	1	2	36	1	1	2
126	3	2	3	46	2	1	2	39	1	1	2
155	3	2	3	48	2	1	2	49	1	1	2
158	3	2	3	53	2	1	2	50	1	1	2
150	3	2	3	85	2	3	2	58	1	1	2
130	3	2	3	92	2	3	2	60	1	1	2
98	3	2	3	93	2	3	2	42	1	2	2
108	3	2	3	66	2	3	3	57	1	2	2
25	3	2	2	68	2	3	3	64	1	2	2
89	3	2	2	99	2	3	3	65	1	2	2
91	3	2	2	104	2	3	3	72	1	2	2
103	3	2	2	109	2	3	3	73	1	2	2
128	3	2	2	111	2	3	3	67	1	2	3
152	3	2	1	112	2	3	3	70	1	2	3
132	3	2	1	113	2	3	3	76	1	2	3
141	3	2	1	122	2	3	3	61	1	3	2
101	3	2	1	123	2	3	3	80	1	3	2
110	3	2	1	124	2	3	3	71	1	3	3
125	3	2	1					78	1	3	3

TABLE C

Showing relative standing of each individual in grammar school No. 1', high school No. 1, and college No. 1, of 158 pupils.

From a glance at table C it may be seen that a great many of the pupils tend to remain within the group in which they started out in the grammar school.

There are some extremes, such as numbers 71 and 78, or 118 and 140, but these are comparatively few. The relative decline or progress of a student's work throughout the three institutions may readily be

seen in such cases as 67, 70, and 76, or in such cases as 152, 132, and 141, respectively.

The proportionate retention is higher between grammar school No. 1′, high school No. 1, and college No. 1, as shown by diagram IV, than is the retention for grammar school No. 5′, high school No. 5, and college No. 2, as shown in diagram III.

In diagram IV there are no pupils who pass from the lower third in the grammar school to the higher third of the high school, but there are four pupils who pass from the higher group of the grammar school to the lower group of the high school. These latter four pupils never get back to the high group in the college; two of them remain in the lower group, and two of them get up to the second group in the college.

On the other hand, in diagram III three pupils fall to the low group as they pass from the grammar school to the high school. But two of these get back to the middle group and one of them up to the high group in college.

Diagram IV indicates that while many of the pupils do pass straight through the three institutions within the same group, yet some of those who appear in the respective groups in the college have arrived there by devious pathways. The retention for the higher and lower tertiles is clearly higher than that for the middle. The advantage of such a diagram as this is that it shows what sort of pupils, in the way of scholarship, constitute the groups at the several stages of progress in the different institutions.

Table XII is a summary of the comparisons made between grammar school No. 6′, high school No. 6, and college No. 3. These schools all use the letter system of grading but it was not possible to secure any large number of marks from the college records.[1]

In table D, column 2 in the high tertile shows a retention of 15 pupils in the high school; column 2 in the middle tertile, a retention of 12, and column 2 in the lower tertile, a retention of 20 pupils in the high school.

Columns 1, 2, and 3 in the high tertile show a retention of 11 pupils throughout the three institutions; columns 1, 2, and 3 in the middle

[1] The college uses the letters *a*, *b*, *c*, the high school and grammar school each *e*, *g*, and *f*. These were reduced to percentages in the same manner as has been indicated with the previous marks. While the cases are not numerous here, the attempt has been made to get as accurate a collection as possible. In chart 129 the pupils are numbered in order of their standing. *e* is used to represent 95 per cent; *g*, 85; *c*, 75, etc.

tertile, a retention of 5, and columns 1, 2, and 3 in the lower tertile, a retention of 16 pupils throughout the three institutions.

8th Grade Eng.

H.S.No.6 Ch.129,130 Aver.4 yrs.Eng				
	1	2	3	Ter. Ret.
1	15	15	0	50.00
2	8	12	10	40.00
3	7	3	20	66.66
Tot.Ret.				52.22

4 yrs.Aver.

Col.No.3 Ch.130,131 Fr.Eng.				
	1	2	3	Ter. Ret.
1	14	11	5	46.66
2	14	12	4	40.00
3	2	7	21	70.00
Tot.Ret.				52.20

8th Grade Math.

H.S.No.6 Ch.132,133 Fr.Math.				
	1	2	3	Ter. Ret.
1	15	8	2	60.00
2	8	6	10	25.00
3	2	10	13	52.00
Tot.Ret.				45.94

Fr. H. S. Math.

Col.No.3 Ch.133,134 Fr.Math.				
	1	2	3	Ter. Ret.
1	15	7	3	60.00
2	8	7	9	29.16
3	2	10	13	52.00
Tot.Ret.				47.29

6,7,8 Gr.Eng.

H.S.No.6 Ch.135,136 Aver.of Fresh. & Soph.Math.				
	1	2	3	Ter. Ret.
1	8	10	1	42.10
2	8	4	8	20.00
3	3	6	10	52.63
Tot.Ret.				37.24

Fr. Soph. H.S.

Col.No.3 Ch.136,137 Fr.Math.				
	1	2	3	Ter. Ret.
1	12	6	1	63.15
2	7	4	9	20.00
3	0	10	9	47.36
Tot.Ret.				43.10

8th Grade Hist.

H.S.No.6 Ch.138,139 Soph.Hist.				
	1	2	3	Ter. Ret.
1	13	5	3	61.90
2	5	11	5	52.38
3	4	4	13	61.90
Tot.Ret.				58.73

So. Hist.

Col.No.3 Ch.139,140 Fr.Hist.				
	1	2	3	Ter. Ret.
1	12	5	4	57.14
2	4	13	4	61.90
3	5	3	13	61.90
Tot.Ret.				60.31

TABLE XII

Showing retention in grammar school No. 6', high school No. 6, and college No. 2.

Pupils	Low Tertile		
63	3	3	3
66	3	3	3
72	3	3	3
74	3	3	3
75	3	3	3
76	3	3	3
78	3	3	3
80	3	3	3
82	3	3	3
83	3	3	3
84	3	3	3
85	3	3	3
87	3	3	3
88	3	3	3
89	3	3	3
90	3	3	3
64	3	3	2
65	3	3	2
67	3	3	2
86	3	3	1
71	3	2	3
77	3	2	3
81	3	1	2
66	3	1	2
69	3	1	2
62	3	2	1
70	3	1	3
73	3	1	3
79	3	1	3
81	3	1	3

Pupils	Mid.Tertile		
34	2	2	2
37	2	2	2
39	2	2	2
44	2	2	2
45	2	2	2
33	2	2	1
36	2	2	1
41	2	2	1
43	2	2	1
81	2	2	1
32	2	2	3
47	2	2	3
31	2	1	1
46	2	1	1
56	2	1	1
48	2	1	2
50	2	1	2
53	2	1	2
59	2	1	2
38	2	3	2
49	2	3	2
52	2	3	2
60	2	3	2
35	2	3	3
40	2	3	3
42	2	3	3
55	2	3	3
57	2	3	3
54	2	1	3
58	2	3	1

Pupils	High Tertile		
2	1	1	1
3	1	1	1
4	1	1	1
5	1	1	1
6	1	1	1
7	1	1	1
14	1	1	1
21	1	1	1
22	1	1	1
23	1	1	1
24	1	1	1
10	1	1	2
13	1	1	2
15	1	1	2
20	1	1	2
1	1	2	1
8	1	2	1
12	1	2	1
16	1	2	1
19	1	2	1
26	1	2	1
29	1	2	1
30	1	2	1
9	1	2	2
11	1	2	2
17	1	2	2
18	1	2	2
25	1	2	2
27	1	2	2
28	1	2	2

TABLE D

Showing relative standing of each pupil in grammar school No. 6', high school No. 6. and college No. 6, of 90 pupils.

Diagram V and table D show that no pupils in passing from the high third of the grammar school fall to the lower third in the high school and then pass back to the high third in college; but number 62, for

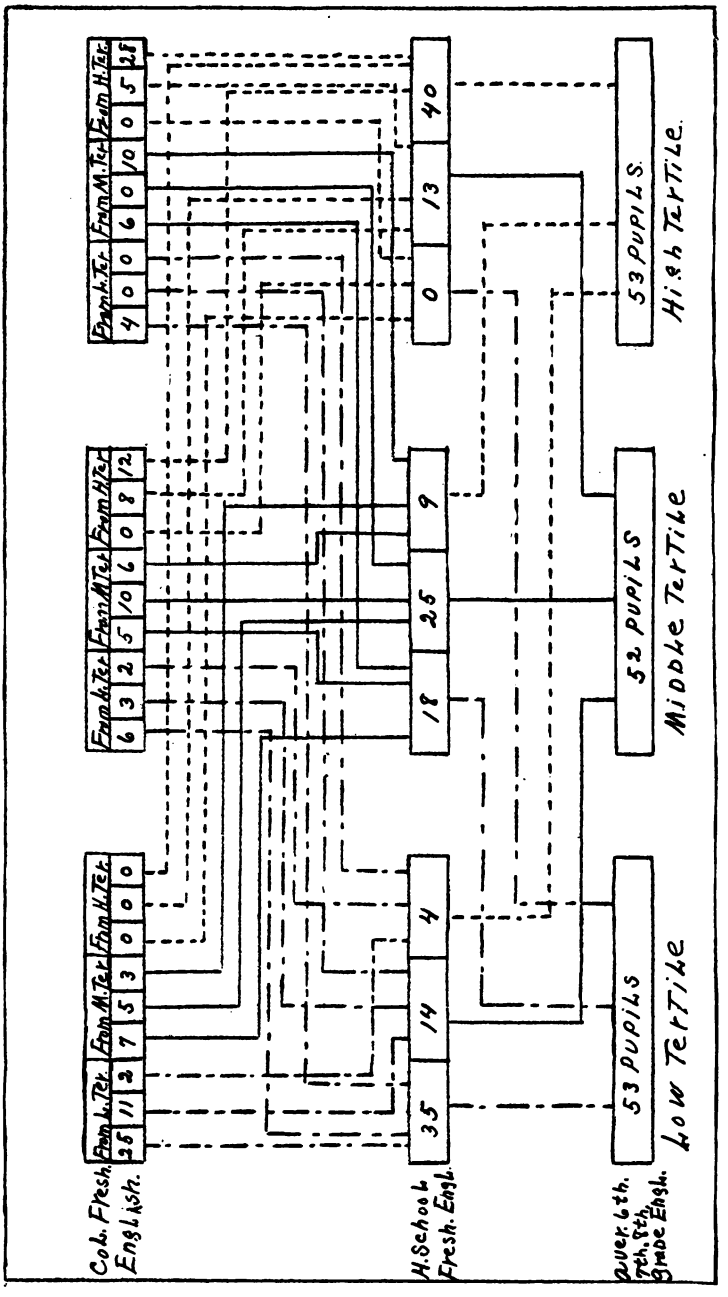


DIAGRAM IV

Showing group retention of pupils in Charts 119, 120, 121, grammar school, high school, college

example, passes from the lower group of the grammar school to the middle group in the high school and to the high group in the college, and numbers 70, 73, 79, 81 go from the low group in the grammar school to the high group in high school and back to the low group in college. As previously stated, it is important not only to know in what respective groups pupils appear in college, but it is equally important to know over what path, circuitous or straight, they have come.

Table D and diagram V show that there is a larger proportionate retention than was the case in table B and diagram III, but that there is a smaller proportionate retention than was the case in table C and diagram IV. Consequently the result is that according to this diagrammatic scheme the retention of pupils throughout the three institu-

8th Gr. Eng.	H. S. No. 6 Charts 141, 142. Av. 4 yrs. Eng.				Av. 4 yrs. Eng.	Col. No. 1 Charts 142,143 Fr. Eng.				8th Gr. Eng.	H. S. No. 6 Charts 141,144 Fr. Eng.				8th Gr. Eng.	Col. No. 1 Charts 144,145 Fr. Eng.			
	1	2	3	Ter. Ret.		1	2	3	Ter. Ret.		1	2	3	Ter. Ret.		1	2	3	Ter. Ret.
1	8	3	1	66.66		7	3	2	58.33		6	5	1	50.00		7	3	2	58.33
2	3	5	3	45.45		3	7	1	63.63		5	3	3	27.27		2	7	2	63.63
3	1	3	8	66.66		2	1	9	75.00		1	3	8	66.66		3	1	8	66.66
	Tot. Ret.			60.00		Tot.Ret.			65.71		Tot.Ret.			48.57		Tot.Ret.			62.85
8th Gr. Eng.	H. S. No. 6 Charts 141, 146. Gen. Eng.				Gen. Eng.	Col. No. 1 Charts 146,147 Fr. Eng.				8th Gr. Arith.	H. S. No. 6 Charts 148,149 Fr. Math.				Fr. Math.	Col. No. 1 Charts 149,150 Fr. Math.			
	1	2	3	Ter. Ret.		1	2	3	Ter. Ret.		1	2	3	Ter. Ret.		1	2	3	Ter. Ret.
1	9	3	0	75.00		7	4	1	58.33		5	2	0	71.42		5	2	0	71.42
2	2	7	2	63.63		3	5	3	45.45		1	2	3	33.33		2	3	1	50.00
3	1	1	10	83.33		2	2	8	66.66		1	2	4	57.14		0	1	6	85.71
	Tot. Ret.			74.28		Tot.Ret.			57.14		Tot/Ret.			53.00		Tot.Ret.			70.00

TABLE XIII

Showing retention in grammar school No. 6′, high school No. 6, and college No. 1.

tions is highest in the case of grammar school No. 1′, high school No. 1, land college No. 1.

On the whole, it is obvious that the percentages of retention are ower than in table XI. With the exception of the relation between charts 129 and 130 the retention is higher between the high school and college than it is between the grammar school and high school, as indicated by table XII, which is exactly the reverse of the results shown in table XI. The retention for both the grammar school and high school and for the high school and college is not far from 50 per cent.

The number of pupils involved in the comparison summarized in tables XII and XIII are too few to make anything but tentative conclusions. But on the whole, the percentages of retention between

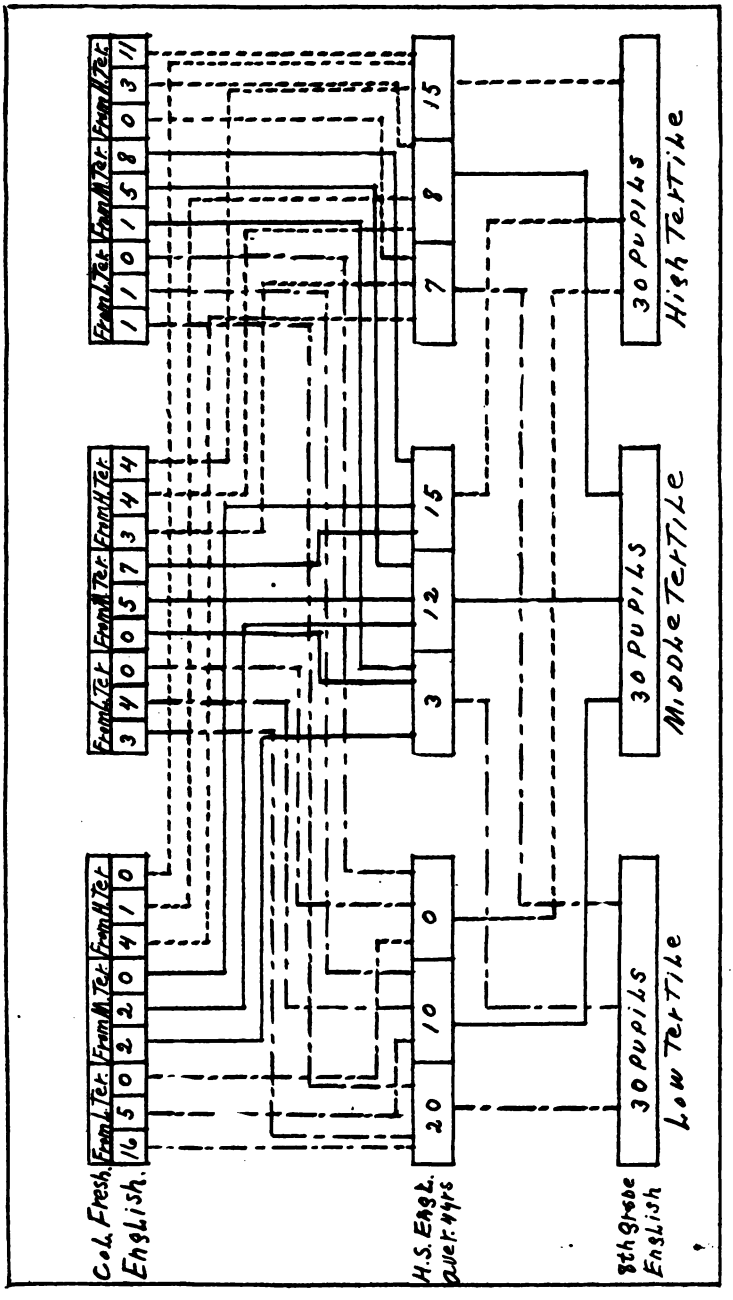


DIAGRAM V

Showing group retention of pupils in Charts 129, 130, 131, grammar school, high school, college

high school No. 6 and college No. 1 are higher than the retentions between high school No. 6 and college No. 3. This is some indication that the standards in college No. 3 and college No. 1 are different.

The results of the summary tables for the whole sec. V, which compares the grammar school, high school, and college marks of the same pupils, are as follows: The retention for grammar school No. 5′, high school No. 5, and college No. 2 is about 50 per cent; that for grammar school No. 1′, high school No. 1, and college No. 1 is about 60 per cent,[1] and that for grammar school No. 6′, high school No. 6, and college No. 3 is somewhat above 50 per cent, according to the tertile method.

When comparisons are made in terms of the average of the percentages of those pupils in the upper and lower tertiles who remain above or below the median there is a retention between grammar school No. 5′ and high school No. 5 of about 70 per cent;[2] *between grammar school No. 1′ and high school No. 1 of about 85 per cent;*[3] *between grammar school No. 6′ and high school No. 6 of about 75 per cent.*[4] *The retention between high school No. 5 and college No. 2 is about 70 per cent; between high school*

[1] It may be that a part of the higher retention in schools Nos. 1′, 1, 1, is accounted for by the influence of college No. 1, as before stated.

[2] The actual retention is 71.92 between eighth-grade and high-school Freshman English; 67.90 between high-school Freshman English and Freshman English, college No. 2; 74.99 between eighth-grade English and Freshman-Sophomore high-school English; 71.47 between Freshman-Sophomore English and English, college No. 2.

[3] The actual retention is 85.13 between sixth-, seventh-, and eighth-grade English and high-school German; 83.78 between high-school German and Modern Languages in college No. 1; 80.18 between sixth-, seventh-, and eighth-grade English and high-school Freshman English; 83.95 between high-school Freshman English and Freshman college English; 83.91 between sixth-, seventh-, and eighth-grade English and average of 3 years' high-school English; 83.01 between average of 3 years' high-school English and Freshman college; 82.35 between sixth-, seventh-, and eighth-grade English and average of 3 years' high-school English; 88.23 between average of 3 years' high-school English and average of 4 years' college English; 91.66 between sixth-, seventh-, and eighth-grade arithmetic and average of 2 years' high-school mathematics; 88.88 between average of 2 years' high-school mathematics and Freshman college mathematics.

[4] The actual retention is 79.99 between eighth-grade English and 4 years' average of high-school English; 75 between 4 years' average of high-school English and Freshman college; 62 between eighth-grade mathematics and high-school Freshman mathematics; 80 between high-school Freshman mathematics and college Freshman mathematics; 73.68 between sixth-, seventh-, and eighth-grade arithmetic and high-school Freshman-Sophomore mathematics; 81.57 between Freshman-Sophomore high-school mathematics and Freshman college mathematics; 83.33 between eighth-

No. 1 and college No. 1 about 85 per cent; between high school No. 6 and college No. 3 about 75 per cent.

The general result of the comparisons made between the grammar schools, high schools, and colleges in sec. V is that there are many pupils, as shown by the diagrams, who go through the three institutions without shifting their positions outside of the groups in which they began their grammar-school work. And although there is some shifting in the high and low groups, there are relatively few pupils who make extreme shifts in either the way of decline or progress in passing through the three institutions. Naturally there are fewer pupils who maintain their positions throughout the three institutions than between any two, respectively.

While some of the retentions between grammar schools and high schools and between high schools and colleges are below 75 per cent, and one school is considerably above 75 per cent, yet it is safe to assume that for the schools as a whole there is a retention in terms of the modified median method used of about 75 per cent between the three institutions of learning—namely, the primary, secondary, and higher institutions.

grade history and high-school Sophomore history; 69.04 between high-school Sophomore history and college Freshman history. There are some irregularities in the retention between high school No. 6 and college No. 1, but the cases are not numerous enough to modify the above results materially.

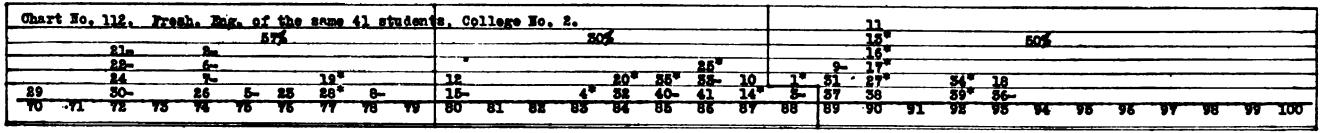


Chart No. 112. Fresh. Eng. of the same 41 students. College No. 2.
57%
50%
50%
70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

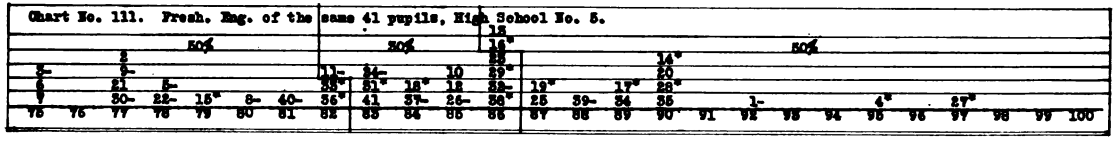


Chart No. 111. Fresh. Eng. of the same 41 pupils, High School No. 5.
50%
50%
50%
75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

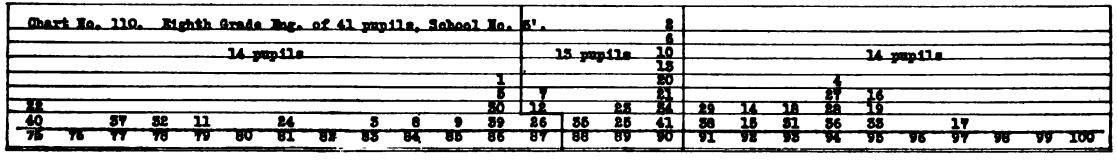


Chart No. 110. Eighth Grade Eng. of 41 pupils, School No. 5'.
14 pupils
13 pupils
14 pupils
75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

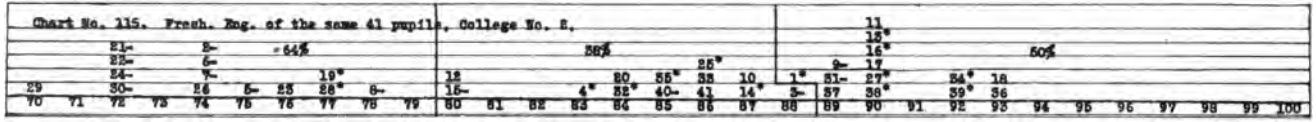


Chart No. 115. Fresh. Eng. of the same 41 pupils, College No. 2.
64%
58%
50%
70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

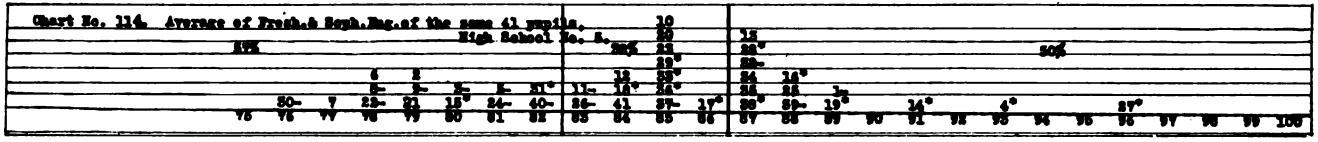


Chart No. 114. Average of Fresh.& Soph.Eng.of the same 41 pupils.
High School No. 2.
50%
75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

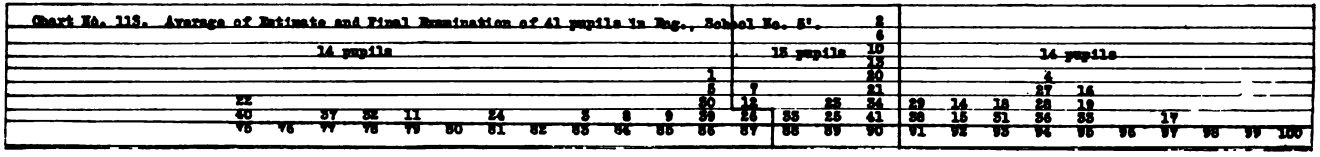


Chart No. 113. Average of Estimate and Final Examination of 41 pupils in Eng., School No. 5'.
14 pupils
18 pupils
14 pupils
75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

Chart No. 116. Average of the 6th, 7th, and 8th Grade Reg. of 111 pupils, School No. 1.

				57 pupils	
				33	
37 pupils			37 pupils	38	1
				39	2
				40	4
			79 3	42	5
			90 24	44	6
		74	92 28	45	8
		88	94 30	50	9
		89	97 31	52	10
		91	102 34	59	11
		95	105 36	60	12
	127	96	106 37	63	13
	131	98	109 43	64	14
	139	100	113 46	65	17
	142	108	115 47	67	18
	144	110	116 48	70	19
	146	126	119 51	71	20
	147	130	122 53	73	21
107	148	136	123 62	80	22
152	149	138	124 69	82	26
157	151	141	128 75	83	29
158	153	146	143 77	86	32
75	80	85	90		95

Distribution of Marks in English in Chart No. 116.

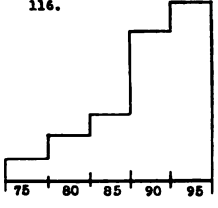


Chart No. 117. The 111 pupils in beginning German when in Jun. Year, High School No. 1.

				40*	1*
67%			51%	44*	4*
				48*	5*
		24		47	6*
		28		48	8*
		42*		50*	9*
		46		51	10*
		64*		52*	11*
		70*		59*	12*
		73		60*	13*
63*		79	2*	66*	14*
71		86	3	67*	17*
83		88-	33*	69	18*
89-		91-	37	75	19*
94		92	39*	90	20*
95-		96-	53	97	21*
128-	45	98-	62	107-	23*
136-	77	100-	74-	110-	26*
138-	80	106	82	115	29*
139-	109	108-	102	119	30
148-	136-	113	105	124-	31
147-	143-	116	130-	128-	32*
148-	146-	125-	144-	141-	34
149-	152-	127-	146-	161-	36
153-	157-	131-	158-	154-	38*
80	85	90	95	97.5	

Distribution of Marks of the same pupils in High School German, Chart No. 117.

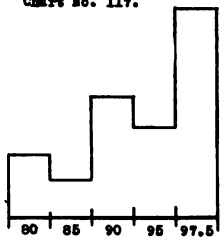
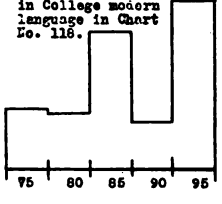


Chart No. 118. Modern Language of the same 111 students, Fresh. Year, College No. 1.

				75%	
				38*	1*
70%			51%	39	4*
				44*	5*
		106-		45*	6*
		107	2	46	8*
		110	11*	47*	9*
77-		115	26*	48*	10*
80-	3	122-	31*	50*	12*
92-	37	126-	33	51*	13*
95-	43-	131-	42	20*	52*	14*
96-	67*	141	60*	24	53	17
98-	70	143-	62	36*	59*	18*
108-	71-	145	63-	40*	64	19*
136-	72	146-	75	65*	73	21*
138-	89-	147-	82	69	83-	23*
139-	100-	148-	86	74	102	28
142-	109-	149-	91-	88-	119	29*
144	115-	161	94-	90	123-	30*
153-	116-	162-	97	128	127-	32*
157-	124	154	105	130	158	34*
75	80	85		90	95	

Distribution of Marks of the same pupils in College modern language in Chart No. 118.



Distribution of Marks in Eng. Chart No. 119.

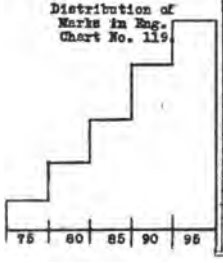


Chart No. 119. Average of 6th, 7th and 8th Grade Eng. of 156 pupils in School No. 1.

53 pupils				105	52 pupils			53 pupils			
	41			106	55	3					
	118			109	62	24		67	42	17	1
	127			111	66	28		70	44	18	2
	131	114	25	112	68	30		71	45	19	4
	135	117	74	113	69	31		72	49	20	5
	140	120	88	115	75	35		73	50	21	6
	142	126	89	116	77	34		76	52	22	7
	144	129	91	119	79	36		78	56	25	8
	145	130	95	121	90	37		80	57	26	9
107	146	132	96	122	92	45		81	58	27	10
152	147	133	98	123	93	46		82	59	29	11
154	148	134	100	124	94	47		83	60	32	12
155	149	136	101	125	97	48		84	61	35	13
156	150	137	103	126	99	51		85	63	38	14
157	151	138	108	135	102	53		86	64	39	15
158	153	141	110	143	104	54		87	65	40	16
75	80	85			90				95		

Distribution of Marks in Eng., Chart No. 121.

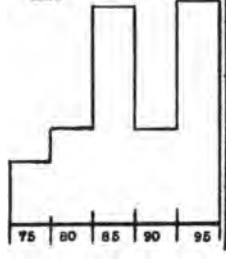


Chart No. 121. Average of 2 semesters of Fresh. Eng. of the same 158 students, College No. 1.

71%			46%				62%		
	111-			24			77	26*	1*
	112-		80-	25			79	28*	2*
41-	115-		83-	27*			82	29*	4*
72-	114-		84	35*			90	30*	5*
76	115		86	37*			101	31*	6*
96-	116		87	38*			102	32*	7*
99-	67	120-	88-	39*		3*	105	36*	8*
117-	68-	121	89	42	54	18*	110	40*	9*
124-	70	122-	91	46*	57	20*	118	44*	10*
127-	66-	123-	92-	58*	64	21*	119	45*	11*
129-	78-	126	94	60*	81	23*	125	47*	12*
130	100-	134-	96-	61-	85	33*	132	51*	13*
131-	108	138-	97	65	92-	34*	140-	52*	14*
133-	137-	145-	98	69	103	43*	141	55	15*
136-	148-	150	104-	72	128	48*	143-	56*	16*
139-	144-	151-	106	73	135-	49*	146-	59*	17*
149-	147-	152-	107-	74-	148-	50*	152	62	19*
156-	158	155	109-	75	154-	53*	157-	63*	22*
75	80		85		90			95	

Distribution of Marks in Eng. Chart No. 120.

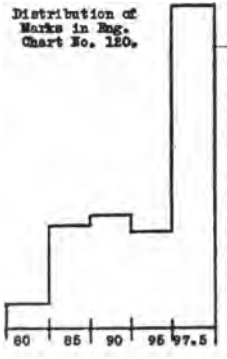


Chart No. 120. Average of 2 semesters of Fresh. Eng. of the same 158 pupils, High School No. 1.

66%				48%				75	78%		
								82	44*	20*	1*
								85	45*	21*	2*
								86	46	22*	3
								89-	47	23*	4*
								90	48	24*	5*
			107-					91-	49*	27*	6*
		61*	112	25-				94	50*	28	7*
	135-	66	114-	42*	87			97	51	29*	8*
	136-	68	117-	72*	98-	24	103-	52*	30	9*	
	137-	71*	123	73*	101-	31	110-	53	32*	10*	
	138-	74-	127-	77	102	54	116	56*	33*	11*	
	139-	78*	129-	83	105	55	119	58*	34	12*	
	140-	80*	131-	88-	106	57*	125-	59*	35	13*	
41-	145-	93	134-	92	106-	62	126-	60*	36	14*	
120-	147-	109	143-	95-	116	70*	128-	63*	37	15*	
124	149-	111	144-	96-	121	76*	132-	64*	38*	16*	
133-	155-	118	146-	99	130-	79	150-	65*	39*	17*	
151-	154-	118-	146-	100-	141-	81	152-	67*	40*	18*	
157-	156-	122	148-	104	158-	84	155-	69	45	19*	
80	85		90		95			97.5			

Distribution of Marks in Eng. (duplicate) Chart No. 119.

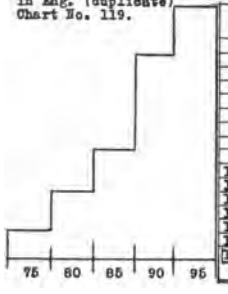
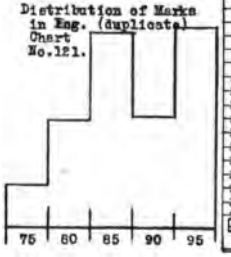


Chart No. 119. Average of 6th, 7th and 8th Grade Eng. of 158 pupils, School No. 1. (duplicate)

53 pupils				52 pupils			53 pupils			
	41			105						
	118			106	55	3				
	127			109	62	24	67	42	17	1
	131	114	25	111	66	28	70	44	18	2
	139	117	74	112	68	30	71	45	19	4
	140	120	88	113	69	31	72	49	20	5
	142	126	89	115	75	35	73	50	21	6
	144	129	91	116	77	34	76	52	22	7
	145	130	95	119	79	36	78	56	23	8
107	146	132	96	121	90	37	80	57	26	9
152	147	133	98	122	92	43	81	58	27	10
154	148	134	100	123	93	46	82	59	29	11
155	149	136	101	124	94	47	83	60	32	12
156	150	137	103	125	97	48	84	61	33	13
157	151	138	108	128	99	51	85	62	38	14
158	153	141	110	130	102	53	86	64	39	15
75	80	85		143	104	54	87	65	40	16
				90					95	

Distribution of Marks in Eng. (duplicate) Chart No.121.



67% 44% 60%

Chart No. 121. (duplicate) Average of 2 semesters of Fresh. Eng. of the same 158 students.

		111-			24*			77-	26*	1*
College		112-	80-	26				79	28	2*
No.1.		113-	83-	27*				82*	29	4*
71-		114	84	35*				90*	30	5*
76		115	86	37*				101	31	6*
96		116	87	38*				102	32*	7*
99-	67	120-	88-	39*		5*		105	36*	8*
117	68-	121-	89	42	54	18*		110*	40*	9*
124-	70	122-	91	46	57	20*		118	44*	10*
127-	66	123-	92	58	64	31*		119*	45*	11*
129-	78-	126-	94	60	81	23*		125-	47*	12*
150-	100-	134-	95-	61-	86*	33		132-	51	13*
151-	108	136-	97*	66	93	34		140-	52*	14*
123-	137-	145-	98	69*	103*	43*		141	55	15*
126-	142-	150	104	73-	128*	48*		143-	56	16*
129-	144-	151-	106	73	135-	49		146-	59	17*
149-	147-	153-	107	74-	148-	50*		152*	62	19*
156-	158-	155*	109-	75	154-	63*		157-	63*	22*
75	80		85			90			95	

Distribution of Marks in Eng., Chart No. 123.

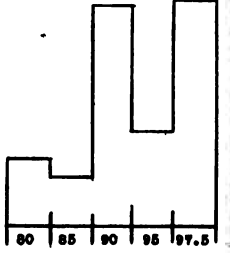
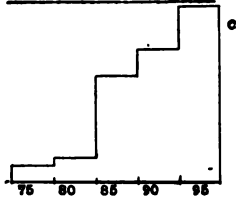


Chart No. 122. Average of 3 years Eng. of the same 158 pupils, High School No. 1.

67%				48%				62%		
			125-	92				46	17*	1*
			126-	93	25-			50*	18*	2*
			129-	94	42*	51		52*	19*	3
		109	61*	130-	96-	55	54	20*	53	23*	4*
		112	66	131-	98-	57*	56*	21*	65*	27*	5*
		120-	71*	132-	101-	60*	58*	22*	69	32*	6*
	41-	127-	74-	134-	105	64*	59*	24	82	35	7*
	72*	136-	77	135-	106	66	62*	26*	85	36	8*
	111	137*	78*	141-	107-	70*	65*	28	90	37	9*
	113	139-	80*	143-	108-	72*	67*	29*	97	38*	10*
	122	140-	85	145-	114-	76*	75	30	103-	39*	11*
	134	144-	88-	146-	116	84	79	31	110-	40*	12*
	135-	149-	95-	147-	117-	86	81	33*	119	43	13*
	139-	153-	99	148-	118-	87	102	34	128-	44*	14*
	148-	154-	100-	157-	121	89-	116	46	132-	45*	15*
	151-	156-	104	158-	123	91-	150-	49*	156-	47	16*
80		85			90		95		97.5	

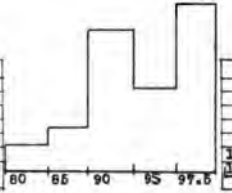
Distribution of Marks in Math. In Grammar School No. 1.



Ch. 126 Average of 6th, 7th, 8th Grade Mathematics
55 Pupils in Kansas School No. 1.

18 pupils			19 pupils		18 pupils		
		136	100	24			
		139	110	66	51	21	1
	95	139	113	68	55	27	6
	105	141	119	74	75	34	7
	109	144	120	77	76	36	9
122	127	146	131	81	78	38	10
133	134	151	135	92	83	40	11
136	140	157	149	98	87	44	17
75	80	85	90			95	

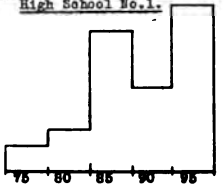
Distribution of Marks in Math. in College No. 1.



Ch. 127 Average of First Two Years of Math.
Same 55 Pupils in High School No. 1.

77%			68%			88%			
		92							
	139-	92							
83	146-	96-	84	109-	51*	75*	36*	11*	1*
113	151-	98	86	120	74	87	38*	17*	5*
136-	152-	122-	88	131	81	110	40*	21*	7*
140-	156-	127-	96*	141-	100	119	44*	27*	9*
144-	157-	134-	98	149	105	135	66*	34*	10*
80	85	90		95			97.5		

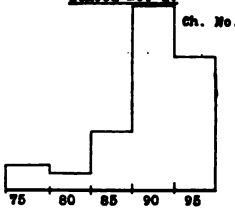
Distribution of Marks in Math. High School No.1.



Ch. 128 Freshmen Math. in College No. 1.
Same 55 Students.

72 %			54*	42%		61%		
			56			11*	56*	1*
144-	127-	81	68	75*	93	40*	44*	5*
149	133-	98-	74	83-	110*	84	105	51	7*
158-	140-	100	76	96	121	87*	119	55*	10*
156-	154-	115-	77-	109	138-	90*	120	136	17*
157-	139-	122-	78	151-	146-	87*	136-	141	21*
	75			80	85		90	95	

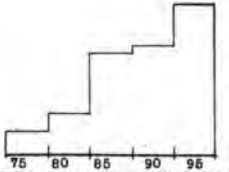
Distribution of Marks English Grammar School No. 1.



Ch. No. 123 Average of 6th, 7th, 8th Grade English Grammar
50 Pupils in Kansas School No. 1.

17 pupils			16 pupils		19 pupils		
		88	105		25	2	
		89	115	68	28	4	
		91	116	69	30	45	5
		103	121	77	31	49	6
			124	79	43	50	8
107		120	125	90	46	70	26
152	149	135	128	104	47	71	29
156	150	134	143	105	48	82	32
75	80	85		90		95	

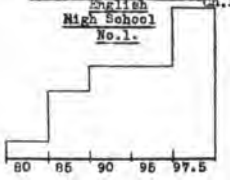
Distribution of Marks English College No. 1.



Ch. No. 125 Average of 4 Years English
Same 50 Students (Graduates) in College No. 1.

64%			43%			64%		
			49					
		107-	66-	70	31	50*	26	2*
	71-	116-	69*	88-	32*	82*	29	4*
	91	120-	77-	115	43*	90*	30	5*
	104	128*	79	121-	46	103*	33	6*
124	133-	134-	89	150	47*	108-	44*	8*
156-	148-	145-	105	152	48	125-	45*	26
75	80	85		90		95		

Distribution of Marks English High School No.1.



Same 50 Pupils in Kansas High School No.1.
Ch.124 Average of 3 Years English

64%			70*	26*		58%		
			89-	28*				
			91-	29*	47	2*		
		68	105	30	48	4*		
		71*	116	31	50*	5*		
		77	107-	33*	69	6*		
		88-	116	46	82*	8*		
		104	121-	49*	90	32*		
		120-	125-	79	103-	43		
	124-	149-	134-	115	128-	44*		
	133-	156-	143-	150-	152-	45		
	80	85	90		95	97.5		

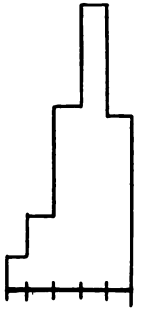


Chart No. 129 8th Grade Eng. 90 pupils.

30 pupils			30 pupils			30 pupils		
		67	56	45	33	22	11	
		68	57	46	34	23	12	1
	78	69	58	47	35	24	13	2
	79	70	59	48	36	25	14	3
	80	71	60	49	37	26	15	4
	81	72	61	50	38	27	16	5
	82	73	62	51	39	28	17	6
87	83	74	63	52	40	29	18	7
88	84	75	64	53	41	30	19	8
89	85	76	65	54	42	31	20	9
90	86	77	66	55	43	32	21	10
75	80		85			90		95

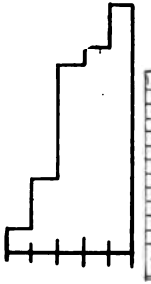


Chart No. 130 Aver. 4 yrs. Eng. 90 pupils

66%			40%			50%		
		60		36	1*			
		63-	9*	37	8*			
		64-	17*	39	11*	54	20*	2*
	40	67-	18*	41	12*	56	21*	3*
	52	68-	19*	43	16*	59	22*	4*
	75-	72-	28*	44	25*	61-	23*	5*
	78-	74-	38	45	26*	66-	24*	6*
	82-	76-	42	47	27*	69-	31	7*
	87-	80-	49	51	29*	70-	46	10*
35	86-	83-	56	62-	30*	75-	48	13*
65-	89-	85-	57	71-	32	79-	50	14*
84-	90-	86-	58	77-	33	81-	65	16
75	80		85			90		95

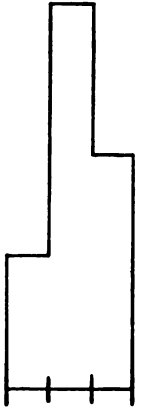


Chart No. 131 Fresh. Col. Eng. 90 students

70%		40%		46%		
32	67-					
35-	69*	38-	1			
40-	70*	39	8	26	2*	
42-	71	44	9	29	3*	
47	72-	45	10*	30	4*	
54*	73*	48	11	31*	5*	
55-	76-	49-	13*	33	6*	
57-	77	50*	15*	36	7*	
63-	79*	58-	17	41	12*	
68-	80-	63*	18	43	14*	
74-	81*	59*	20*	46*	16	
75-	82-	60-	25	51	19	
78-	83-	61*	27	56*	21*	
84-	85-	64-	28	58-	22*	
87-	88-	65-	34	58	23*	
90-	89-	66*	37	86-	24*	
75		85		95		

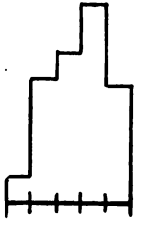


Chart No. 132 8th Grade Arith. 74 pupils

25 pupils			24 pupils			25 pupils			
			62	2					
	75		66	27	61	24	1		
	77	28	67	33	53	25	3	14	5
	80	31	70	40	56	30	13	17	6
	82	41	74	49	58	32	16	18	7
	83	44	76	50	59	35	20	26	8
69	86	54	79	52	63	37	21	36	9
73	89	64	81	55	68	46	22	45	10
85	90	72	87	61	76	48	23	57	12
75		80		85			90		95

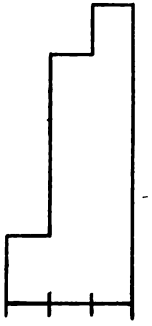


Chart No. 133 Fresh. Math. same 74 pupils

60%		25%			60%		
	64-	40	5*				
	68	41-	8*	66	45*	16*	1*
24*	74-	44-	9*	67-	46	17*	2
28-	75-	50	18*	69-	48	21*	5*
32	76	51	20*	70-	49	22*	6*
56	78-	52	26*	72-	53	23*	7*
73-	83-	55	27	77-	54-	25*	10*
82-	85-	57*	30*	79-	61	31-	12*
87-	86-	58	33	81-	62	35	13*
89-	90-	59	36	80-	63	37	14
75		85			95		

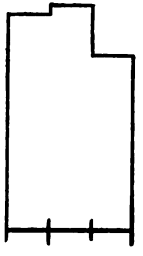


Chart No. 134 Fresh. Math. Same 74 students. Col. No. 3

42%	28%	52-	60%		
68-	1*	53*	12*		
70	9	55-	18		
73-	14*	56-	21*	24-	
75-	20	58-	22*	30	2*
78-	26	62	23*	37*	3
80	28-	63	25*	40	5*
81	32-	64-	27	41	6*
82-	33	67	31*	46*	7*
83-	35*	69	36	54	8
86-	44	72	46*	59-	10*
86-	48*	74-	49*	61*	13*
87-	57-	76-	50-	77	16*
89-	66	90-	51-	79	17
75		85		95	

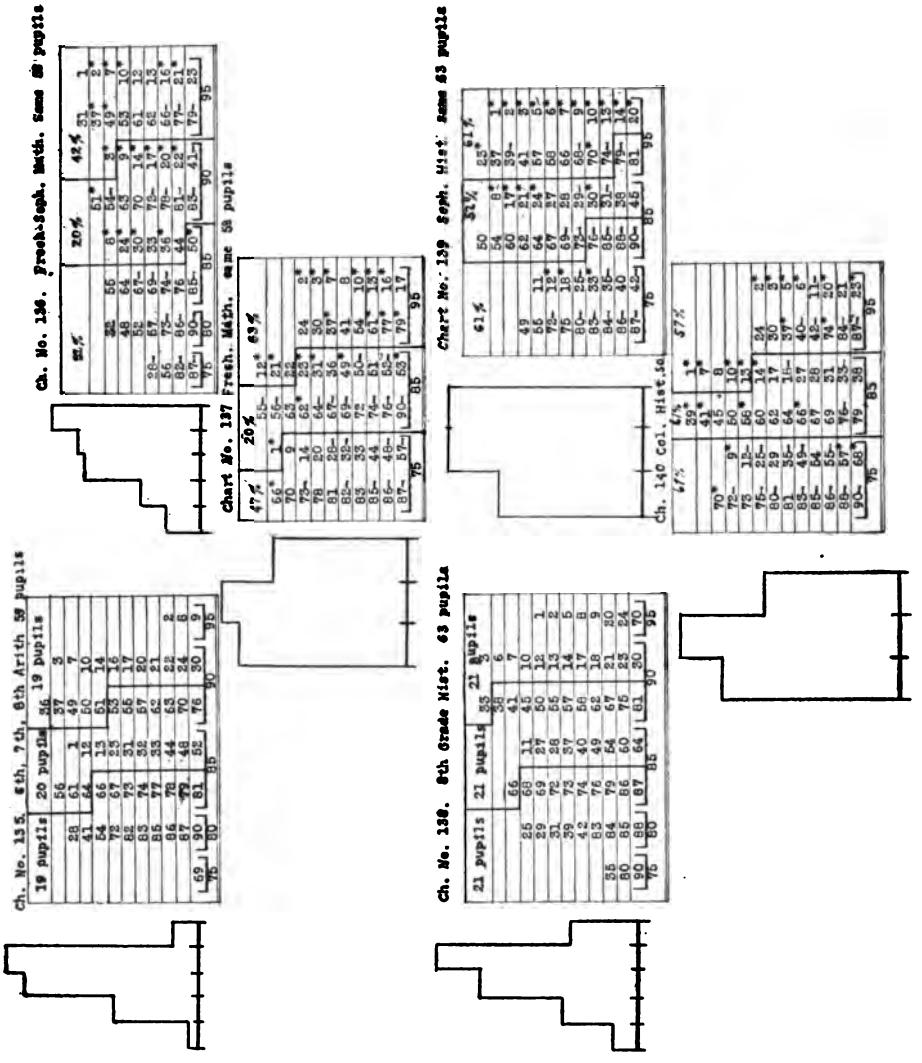

Ch. No. 135. 6th, 7th, 8th Arith 58 pupils
19 pupils
20 pupils
19 pupils
Ch. No. 136. Fresh-Soph. Math. same 58 pupils
Chart No. 137 Fresh. Math. same 58 pupils
Ch. No. 138. 8th Grade Hist. 63 pupils
21 pupils
21 pupils
Chart No. 139 Soph. Hist. same 63 pupils
Ch. No. 140 Col. Hist. 58

Chart No. 141 8th Grade Eng.

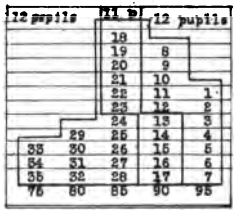


Chart No. 142 Aver. 4 yrs. Eng.

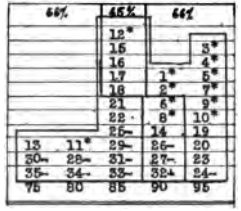


Chart No. 143 Fr. Eng. Col. No. 1

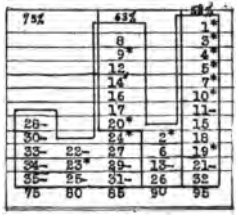


Chart No. 144
Fresh. Eng. H. S. 6

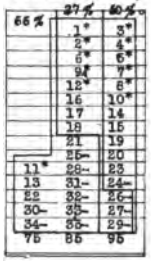


Chart No. 145
Fresh. Eng. Col. No. 1

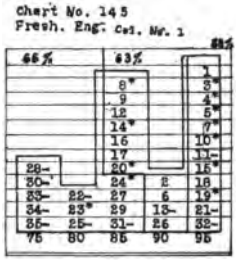


Chart No. 146
Sem. Eng. H. S. No. 4

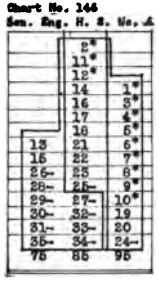


Chart No. 147
Fresh. Eng. Col. No. 2

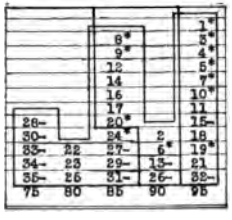


Chart No. 148
Fresh. Math. Col. No. 1

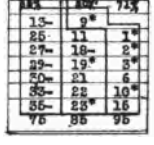


Chart No. 149 Fresh. Math. H. S. No. 6

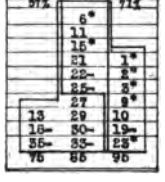
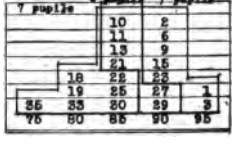


Chart No. 150
8th Grade Arith Sch. 5
4 pupils 7 pupils



CHAPTER IV

General Conclusions

A few conclusions incidental to the main issue of this thesis, and yet not irrelevant to it, will first be set forth. The completer standardization of schools in any state will need to be based upon a *series* of investigations. Such a study as the present one, the writer believes, has value in establishing a more scientific attitude in the analysis of practical school problems.

This thesis has dealt with marks or grades relative to the standardization of schools. There can be no doubt but that scholarship of pupils is one important factor to be taken into account in attempting to get a measure of the efficiency of school systems. Nevertheless, in order to get a balanced estimate of the working standards of school organizations, it will be necessary to carry out other studies supplementary to any study based upon marks. It would be very profitable if some such problems as the nature of school support, the value of material equipments, the measurements of teachers, the significance of the physical, moral, and social life of the pupils, could be worked over in detail in the light of our more scientific attitude in educational doctrine and practice.

As is obvious from the previous sections of this discussion, there is considerable difference of opinion as to the manner of rating pupils within any one state. In the light of this, one cannot avoid the conclusion that there is a great need of clarification, together with more common agreement as to what is the best system of marking; furthermore, as to what is the most expedient form for the preservation of intelligible, accurate, complete, but simple records of the marks made by pupils.

The variation in the distribution of marks referred to frequently in the earlier discussion is evidence that there is lack of agreement in estimating the abilities of pupils. The most general tendency throughout the schools as a whole was the skew toward the top of the scale. Furthermore, in some instances it was found that the grouping of precisely the same pupils was quite different from year to year within the same subjects. We have seen reasons for emphasizing the fact that there is need for the agreement of teachers among themselves upon the rating of pupils in the subjects within any one school.

There is no little difference of opinion as to the range of marks to be used. It is common to find one of two extremes—either a too-wide range, which frequently grows out of a percentage system, or a too-narrow range, which grows out of a letter or number system. When the theoretical scale is too wide, some points or marks are very likely not to be taken into account at all, or sometimes there is a theoretical differentiation too fine to be practicable. When the range or scale is too narrow, a lumping off frequently occurs with a consequent lack of differentiation.

Why would it not be possible to adopt a theoretical scale which will be likely to be followed in practice, and which will, at the same time, overcome in some measure both of the above-mentioned extremes? It will make comparatively little difference whether numbers, letters, qualifying words, or percentage systems are used, providing whatever marks we do decide to use are stated in translatable and comparable forms. Probably a six-, seven-, or eight-estimate system would serve very well for a compromise. And would it not be very profitable to keep a record of the degrees of failure as well as to keep a record of the points of difference between those who pass? We have failed in a large measure to recognize that there is no absolute demarkation or abrupt dividing point between the eliminated pupils themselves as a group and also between the eliminated pupils and those who go on. It is valuable to know not only who has failed and who has passed, but also to know how much more some pupils have failed to pass than others.

The writer is convinced through his experience in attempting to collect the data for this thesis that we are very deficient in the keeping of significant *continuous records* covering at least the period of years included by the eighth grade of the grammar school, the four years of the high school, and the first year of the college. Such records, of course, are indispensable if we care to make a study of pupils' progress throughout the three institutions.

If typical school systems over our country would keep a careful record of the marks of several thousand pupils covering this period of six years of school life, such data in the form of certificates kept on file in the college vaults would furnish material for a check experiment to such an investigation as the present one, and consequently would furnish a means of testing the validity and value of present conclusions. The permanent records can be conveniently kept in the loose-leaf form within bound volumes in both the grammar school and the high school. The transfer of these to the college-entrance certificates would be a simple matter.

From the few comparisons made in this study as well as in some other studies the results seem to indicate that the capacities of children reflected through the pursuance of one school subject are characteristic in a great many instances of the capacities for work in other subjects. In agreement with this Miles says: "These coefficients would seem to show that if a pupil makes a good mark in one subject he will be quite apt to make good marks in all subjects. Similarly, the pupil who is poor in one subject will tend to be poor in all."[1]

After this brief statement of some of the incidental conclusions, it is in place to bring together in a summary way the general results found in the separate sections of the previous discussions with reference to the relative standing of pupils from year to year and from institution to institution, together with the consequent amount of retention.

Percentages of retention have been determined throughout this thesis by means of the tertile method. These percentages have been stated in connection with the charts and in the tables used in the different sections. It is only necessary here to summarize by stating about what the average retention for all the schools compared is. It may be noted that in some cases a few schools show either a higher or lower retention than the following statement of the average. But when the schools are regarded as a whole the average retention within the grammar school is somewhere between 50 and 60 per cent for the upper and lower tertiles, respectively, and between 35 and 45 per cent for the middle tertile; within the high school it is between 55 and 60 per cent for the upper and lower thirds, respectively, and between 40 and 50 per cent for the middle third; from the grammar school to high school it is between 50 and 60 per cent for the high and low groups, respectively, while for the middle it is between 35 and 45 per cent; from high school to college it is between 55 and 65 per cent for the upper and lower groups, and for the middle between 40 and 50 per cent.

If an average of only the upper and lower tertile retentions had been used without consideration of the middle third, the retention would, of course, be considerably higher, and this would be really a more representative statement; for two-thirds of the pupils are included in these upper and lower tertiles, and since much of the interchange in the middle third is of little importance, for reasons previously seen in the body of the thesis, the results as shown by the tertile retention which has been used are conservatively stated and easily warrant the conclusions which follow.

[1] *University of Iowa Studies*, p. 10.

As previously noted, a modified median method has also been employed in ascertaining the retentions and correlations, and the general results of the comparisons are as follows: *within the grammar school there is a retention of at least 75 per cent; within the high school, about 80 per cent; from grammar school to high school, between 70 and 80 per cent, and from high school to college, between 75 and 80 per cent.*

These results are in general agreement with previous studies in so far as the former studies have made these comparisons. Miles has pointed out that the Pearson coefficient of correlation between the average elementary-school grade and the average high-school grade is +.71, and that the correlation between specific subjects is a little higher than this.[1] Dearborn's results for the high school-university comparisons were as follows:

> Considering what percentage of those who were in the highest and lowest quarter of the group in high school remain in the upper and lower halves respectively of the class in the university, a little over 80 per cent of those who were in the lowest or highest quarter of the group in the high school are found in their respective halves of the group throughout the university. With the results of these two methods in mind, we are safe in concluding that three-fourths of the students who enter the university from the high schools will maintain throughout the university approximately the same rank which they held in high school.[2]

Expressed in terms of the two methods used, namely, the tertile method, and the average of the percentages of those pupils in the upper and lower groups who remain above or below the median, the results justify the conclusion that the majority of the pupils who are classified within a certain original group on the basis of marks retain this same grouping, whether we consider their progress within the grammar school or within the high school, respectively, or whether we consider their progress from grammar school to high school or from high school to college. Perhaps the most striking illustration of this conclusion is to be found in the groups of pupils that have been followed from the grammar school through the high school and into college, represented by such charts as 116, 117, 118, including 111 pupils; by such charts as 119, 120, 121, including 158 pupils, and by such charts as 123, 124, 125, including 50 pupils.

In the introductory chapter it was stated that the object first would be to see what the actual existing relation between institutions is and

[1] *Studies in Education at the University of Iowa*, Vol. I, No. 1, pp. 8, 10.

[2] *Bulletin 312*, High School Series No. 6, University of Wisconsin, p. 41.

then, on the basis of such results, make a statement as to what we have a right to expect in the way of retention between institutions.

While the majority of the comparisons have been made between single subjects, yet it has been seen that pupils do about equally well or medium or poor work in all subjects respectively. Consequently the results obtained from the comparisons between single subjects do furnish a safe basis for measuring the efficiency of institutions.

As already indicated, the comparisons made *within* the grammar school and high school were made as a sort of check experiments.

In the light of the author's results found within the grammar school and high school, respectively, and in the light of the results of the other studies made of the relation between grammar school and high school and between high school and college, together with the author's results with reference to the grammar school, high school, and college, it may safely be assumed that we have a right to expect a retention between the grammar school and high school and between the high school and college of at least 75 per cent, or of three-fourths of the pupils.

It is conceivable that this percentage of retention may be justifiable in some schools and not so in others. For it is admitted that it will sometimes be necessary to take account of the exceptional and varying social factors that come in and affect the efficiency of institutions. There may be instances where the correlation between high school and college is markedly higher than 75 per cent. When this is true it may be appropriate to inquire as to how far this is the result of the dominating influence of the college. Any standard of measurement which we attempt to set up ought to assume that institutions will be willing and free to modify practices whenever such modification is conducive to the best progress of the pupils concerned.

If such a standard as this can be accepted as one means of measuring the efficiency of institutions—until we find a different standard superior to the one here suggested there will be some advantage in having a tentative standard of measurement—then those institutions which show a retention of at least three-fourths of their pupils may be pronounced as working efficiently, so far as scholarship is concerned. When the relation or retention between primary, secondary, and higher institutions is markedly lower than 75 per cent, it may be rightly questioned whether such institutions are working in an efficient manner.

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